RETHINKING LEARNING FOR THE META-LEARNER IN HIGHER EDUCATION

A Dissertation submitted to the College of Graduate Studies and Research

in Partial Fulfillment of the Requirements

for the Degree of Doctor of Philosophy

in the Department of Educational Administration

University of Saskatchewan

Saskatoon

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ABSTRACT

The broad purpose of this dissertation is to stimulate the conversation around both the purpose and conceptions of learning in higher education. In the current environment where knowledge is complex, uncertain, and changing there is a need to prepare students to be life-long learners capable of evaluating multiple knowledge claims and solving ill-structured problems. I offer the term meta-learner to articulate how in an environment where knowledge has no boundaries there is a need to understand, take ownership of, and control one's own ways of knowing and personal learning such that learning allows for opening oneself up to the possibilities associated with knowledge uncertainty and complexity.

Personal epistemology is the essence of how the learner knows and so I consider the beliefs about knowledge and knowing associated with the meta-learner as a preamble to discussing three broad views of knowledge. The opportunity for the learning and the development of the belief system associated with meta-learners is explored within the three learning theories: individual, social constructivist and activity theory. I propose an alternate conceptualization of learning for the development of students as meta-learners.

The nature of this study is conceptual and as such it represents just one conception, my conception, of what is required from learning within academia if the meta-learner is to take control and ownership over the process and outcomes of the learning experience and participate in the knowledge creation process. When problems are ill-structured and complex, learning must be anchored in a personal belief that there is value in knowing oneself, others, and the world. I maintain this belief is associated with the ability of the learner to conceive of the possibilities learning holds, creates, and inspires. Learning must be about creating possibilities that strengthen the learner's will to venture forward in an environment where knowledge is uncertain, complex, and changing.

CHAPTER 1

THE PROBLEM

> The attitude of childhood is naïve, wondering, experimental; the world of man and nature is new. Right methods of education preserve and perfect this attitude, and thereby short-circuit for the individual the slow progress of the race, eliminating the waste that comes from inert routine and lazy dependence on the past. Abstract thought is imagination seeing familiar objects in a new light and thus opening new vistas in experience. (Dewey, 1933 p. 202)

Today's economy runs on knowledge (Wenger & Snyder, 2000). In complex, multi-faceted environments, knowledge is perpetually changing (Bhatt, 2000). Understanding and working within this environment are complicated and difficult. Knowledge and the capability to create and utilize knowledge are recognized as key sources of competitive advantage in business (Jakubik, 2008; Nidumolu, Subramani, & Aldrich, 2001; Nonaka & Toyama, 2003; Wenger, 1998). Wenger (2009) suggested knowledge, more than information, is the critical asset that must be managed by organizations; yet there is still little understanding of how to create and leverage knowledge in practice (Arling & Chun, 2011; Jakubik, 2011; Wenger, 1998).

Knowledge is created when meaning is applied to information (Bhatt, 2000). Learning has been defined as the process of taking in information and applying meaning to it (Bhatt, 2000). Learning involves knowledge creation as well as knowledge deconstruction, relearning, forgetting, problem solving, resolving learning process conflicts, and addressing power issues (Jakubik, 2008). Salomon and Perkins (1998) offered a social cultural perspective of learning that suggests learning is not the acquisition of knowledge and skills, but the process of being involved in relationships that facilitate co-participation in communities. An individual's acquired skills or competencies, such as the ability to communicate with others within a profession, are not considered knowledge, but simply the tools for successful participation in social practices. It is successful contextual participation, rather than the tools, that is referred to as knowledge (Greeno & the Middle School Mathematics Through Applications Project Group, 1998).

Considering the importance of knowledge in today's society, what is the purpose of learning in higher education? I postulate there is not universal agreement on the answer to this

question. Given that higher education offers a variety of academic and professional programs with diverse learning experiences, is it appropriate to suggest students are prepared for real-world work experiences in their chosen career path? If real world experience is the assumed purpose what specifically are the desired outcomes and goals of academia? This question is complicated, requiring an understanding of both what students specifically need to learn in order to function as professionals, and how the desired learning outcomes might best be achieved.

This dissertation is about learning in higher education. In it I explore how learning is conceptualized, and might be reconceptualised, in the environment of knowledge uncertainty and change, such that development of the student as a learner is the primary focus. In this chapter I examine the context for learning, and discuss the outcome imperatives for undergraduate education. In Chapter 1 I set the conceptual stage for my analysis of the learning theories, I provide a description of the problem, and I argue for the significance of the meta-learner as an outcome of higher education.

The Knowledge Economy

Economic globalization, fuelled by expanding information and communication technologies, has made knowledge the primary resource of the economy (Seltzer & Bentley, 1999). The ability to create and apply knowledge has become the foundation for competitive advantage and economic growth, directly impacting how people live and learn (Seltzer & Bentley, 1999). People are valued for their ability to create and apply knowledge in their everyday work. There is an ongoing need for individuals to be able to identify, take in, and utilize information for the purpose of creating knowledge; moreover, people in their personal and professional lives actively engage in learning every day. Human capital, including competencies and expertise, is the foundation of the knowledge-based economy (Alic, 1997).

Barnett (2011) argued that the proliferation of knowledge creates greater ignorance because of awareness of 'known unknowns' (p. 7), and by acting on the world through learning, continuous change occurs such that full knowledge and understanding are not possible. Barnett (2000) described this environment where knowledge is tentative and tumultuous as the supercomplex world. He referred to supercomplexity as descriptive of a world with multiple knowledge frameworks and conceptual overload, and essentially a world without knowledge boundaries (p. 415). Supercomplexity is characterized by uncertainty and unpredictability for

which students must be prepared by acquiring competencies in knowledge creation and integration processes, including constructing new forms of knowledge. Students will have to gain skills by reframing, critical thinking, negotiating of meaning through reflection, and insightful action.

A focus on knowledge creation requires that individuals be prepared to leverage knowledge through continuous active learning, and to create new meanings that offer economic advantages to the holder. As the complexity and size of the knowledge base grows there is increased specialization, with academics typically acquiring more depth of knowledge and less breadth in their discipline (Barnett, Ault, & Kaserman, 1988; Morrison, Dobbie, & McDonald, 2003). Schön (1983, 1987, 1995, 2001) stated that professional academic programs, which developed in universities, were based on an epistemology of techno-rationality, where inquiry was guided by established rules and drawn exclusively from the existing technical knowledge of the profession. Professional schools, unlike their counterparts in the fundamental sciences, are considered to be consumers not creators of knowledge, and to apply the knowledge produced by true scholars to real world problems. Research is conceived of as separate from practice with new knowledge coming only from a controlled scholarly environment. This traditional perception of professional knowledge is based on the positivist philosophy that Schön suggested persists in modern universities, and dominates the programs and curriculum of professional schools. In an environment of perpetual knowledge change and growth, the relevance of acquiring a static professional knowledge framework has been questioned by working practitioners. The result, according to Schön, is a growing divide between professional knowledge taught by the university and the learning necessary for undergraduates to function effectively as professionals in the knowledge economy.

Schön (2001) indicated the dilemma for professionals is that the core competencies needed to identify problems in practice are unrelated to the problem-solving model of professional knowledge acquired through higher education. There is a need for higher education institutions in Canada to focus on supporting innovative problem solving and the development of critical thinking and analysis skills for professionals (Lennon, 2010). Huber and Hutchings (2004) stated students are being told that specialized professional knowledge obtained as part of their degree will not be useful in the long term, unless it is combined with the skills and capacity

to seek out and capitalize on opportunities. A report on graduate satisfaction with their postsecondary education in Ontario found that respondents were least satisfied with how well their program had prepared them for the job market (McCloy & Liu, 2010). Respondents rated soft skills such as critical thinking, problem solving, and information management, as important as job-specific skills (McCloy & Liu, 2010). Here within academic programs designed to prepare students to participate as global citizens, is an imperative to re-examine conceptions of learning and the desired outcomes of higher education.

Stating the Problem

Lueddeke (1999) stated that the trends facing higher education in the 21st century include increased competition for external funding and students, greater consumer demand for flexibility in education, and the requirement to develop more challenging educational and research programs. External pressure from diminishing government and industry funding has seen academia shift efforts toward the production of more research and in addition to education and research, the pursuit of economic development involving creating and commercializing intellectual property (Etzkowitz, Webster, Gebhardt, & Terra, 2000). Part of the new reality is that academia is no longer the primary source of knowledge (Barnett, 2000). Building a reputation on research rather than teaching excellence is one of the most important concerns for Canadian universities (Association of Universities and Colleges of Canada, 2011).

The Association of Universities and Colleges of Canada (AUCC, 2011) reported that despite growth in student enrolment as well as government funding in the past 15 years, there is a sense that universities have "lost their way" (p.1) and that the undergraduate learning experience is deteriorating. Canadian university leaders have noted in the past 15 years a growing tendency to prioritize research over teaching and learning. Undergraduate education has been suffering as a result (p.4). The tension between the diverse demands on higher education has resulted in controversial debates for over 10 years regarding access to higher education, employment prospects upon degree completion, and relevancy of higher education in the workforce (Pocklington & Tupper, 2002). Production demands related to research and funding issues are putting pressure on academic programs as higher education moves toward operating more like a private-sector corporation, perpetuating a market model of education and student consumerism (Pocklington & Tupper, 2002; Polster, 2010; Woodhouse, 2010).

The power relationship between students and higher education, along with the information transfer model prevailing in pedagogy, are significantly shaping student identity as consumers of education rather than as participants in the process of constructing knowledge and meaning (Levy, Little, & Whelan, 2011; McCulloch, 2009). There are structures, policies, and practices in place that support the conceptualization of student and teacher identity as consumer and producer of knowledge respectively (Levy et al., 2011; McCulloch, 2009). Marketing education to students as an investment in their future careers has made higher education responsible for delivering on this promise, but has changed the focus from obtaining an education and learning to obtaining a degree that can be marketed later by the student (McCulloch, 2009). This expectation by students of a return on investment is particularly pertinent in the context of professional academic programs. Students entering professional academic programs have a specific career path and their goals are typically more practical (Pocklington & Tupper, 2002; Sullivan, 2012).

Students' perception of themselves as purchasers of an education has jeopardized their engagement in the educational process as well as the development of the skills and dispositions necessary for independent learning throughout their lives (Naidoo & Jamieson, 2007). A recent study of general analytical competencies among senior college students in the U.S. found that students were not developing the desired level of integrative cognitive skills (Arum & Roksa, 2011). Opportunities for more integrative learning experiences are not well incorporated into undergraduate academic programs and are instead being offered in a piecemeal fashion (Huber & Hutchings, 2004).

Research has suggested that students tend to enrol in classes with minimal reading and writing assignments and rarely interact with faculty outside class (Arum & Roksa, 2011; Benton, 2011). A recent survey of first year university students in Ontario found that students were disappointed with the access and contact they had with faculty (Mancuso, Desmarais, Parkinson & Pettigrew, 2010). Roksa and Arum (2011) found that when faculty challenged students by increasing the reading and writing requirements within their courses, students met those expectations and improved their analytical performances. However, some writers have commented that when the economic model operates in higher education with a focus on research to generate funding, teaching resources may be restricted, leading to growing class sizes and

standardized evaluation, which limits the opportunities for integrative learning, skill development, and student-faculty interactions (AUCC, 2011; Clark & Norrie, 2013; Polster, 2010; Smith, 2010).

Sullivan (2012) suggested that the consumerism perspective negates the developmental role of higher education. Education is a formative experience that profoundly influences the identity, opportunities, and lifelong potential of students both as learners and as persons. Sullivan indicated that these effects are holistic; and therefore to be developmentally positive, the entire student experience must be infused with the values and opportunities for active self-development as a learner.

The foundation of liberal education is based on the premise that learning should be more than the sum of its parts, with the capacity to connect those learning experiences central to liberal education (Huber & Hutchings, 2004). There is growing concern that undergraduate education now consists of disconnected classes selected to meet the professional skill development needs of each student, rather than being a whole program aimed at developing critical thinking and integrative capacities (Fink, 2003; Huber, Hutchings, & Gale, 2005). While in the past, higher education has valued contemplation of how the world is, the knowledge economy demands knowledge that allows for action on and engagement with the world (Barnett, 2000). For integrated learning to be achieved, academic leaders believe students need to take on a new educational paradigm, focusing more on the educational experience and less on the credentials (AUCC, 2011).

A consequence of this piece-meal approach to acquiring technical knowledge is a disconnect between the imperatives of the knowledge economy and the undergraduate education occurring in many research and doctoral institutions. There is a failure of sort to achieve the educational experience necessary to build the learning capacities needed given the present knowledge reality. Recognition of the problem is not new, yet the problem persists (AUCC, 2011; Barnett, 2011; Huber & Hutchings, 2004; Huber, Hutchings, Gale, Miller, & Breen, 2007; Scardamalia & Bereiter, 2006). Attempts to address it have been sporadic and for the most part not sufficiently comprehensive to achieve the desired educational outcome of learning. It has been suggested that the lack of initiative and drive to address the issue is to a certain extent attributed to the failure on the part of the general public to recognize that a problem exists, with

students and their families primarily indicating satisfaction with the education they receive (AUCC, 2011). One of the requirements for achieving student engagement in the learning experience is to transform undergraduate students from consumers of information into purposeful and independent enquirers (Lee, Greene, Odom, Schechter, & Slatta, 2004).

Canadian universities are seeing the need to revisit their mandate with undergraduate education identified as a priority (AUCC, 2011). The landscape of higher education as a place for student learning is changing, while the conception of the learning process as a whole has been acknowledged as needing to be altered (AUCC, 2011, p. 3). Zundel and Deane (2010) advocated for the reconceptualization of both teaching and learning processes within academia in Canada, changing the predominant emphasis from teaching to learning.

The Imperative for Integrative Learning and the Intentional Learner

Academic leaders have identified the ability of students to contribute to society as a key outcome of higher education (AUCC, 2011). Other related outcomes include the ability to think, read, and write critically, as well as to present and to undertake reflection and analysis of their own views (AUCC, 2011). Training students for jobs is not sufficient in a complex global knowledge economy of continual change. Equally important is that students be prepared for their role and participation as global citizens. Huber and Hutchings (2004) argued that responsible participation as global citizens requires such skills as: integrating diverse pieces of information from multiple sources and contexts; on-going learning from experiences; and comprehending the relationship between theory and practice. Integrative learning requires the ability to identify, evaluate, and create connections between diverse concepts across disciplines and contexts. These skills are necessary in our knowledge economy, and how to facilitate the development of these cognitive capacities in undergraduate students constitutes one of the current challenges of higher education (Barber, 2012; Huber & Hutchings, 2004; Huber et al., 2007; Swaner, 2012).

To productively participate in the knowledge creation process, students must develop skills and knowledge related to collaboration for the advancement of knowledge (Paavola & Hakkarainen, 2005). It is anticipated that the ill-structured problems students must address may require specific capacities around evaluating knowledge claims, yet little is known about how learners undertake these challenges (Ferguson, Bråten, & Strømsø, 2012). To keep pace with the growing knowledge-intensive challenges of society, “conceptions, practices, and social

organization of learning also have to be transformed so as to facilitate corresponding individual and cultural competencies" (p. 535). Schön (2001) suggested that the technical view of problem solving, which dominates academia and in particular shapes the institutions of professional education, requires stable, well-articulated problems, and is not conducive to the learning environment of uncertainty and change where students must construct the problems to be solved. The learning challenge for leaders of academic programs is to offer an educational experience that facilitates integrative learning and provides students with not only the ability to answer current questions but to formulate the questions necessary to address the anticipated problems of the future.

> In a world where jobs are evolving at the same pace as iPhone upgrades, effective, employable workers need to be able to conduct research, to think critically, to write effectively, to analyze problems and develop solutions, and to have a propensity to learn. In addition, they require civic literacy, global awareness, an understanding of social behaviour and human diversity, and an appreciation of the natural world. These competencies and capabilities are transferable. Many promote flexibility and agility in the workplace and job market. And most contribute to enhanced citizenship. (Petter, 2012, October 30)

Research and learning are closely linked, and together can be identified as the social processes through which knowledge creation is negotiated and communicated (Brew, 1999). To provide learners with the required academic skills, undergraduate education needs to include not only an understanding of research, but also the skills to both undertake and use it (Jenkins & Healey, 2009).

When the desired outcomes of higher education are not well defined, the chances of effective learning occurring are limited (Nicholson, 2011; Schön, 2001; Tagg, 2010). Within academia even if these goals seem clear at the individual faculty or learner level, there is the possibility a lack of a shared vision, which may lead to a multitude of perspectives colliding within the learning experience, and complicate and frustrate the process (Schön, 2001). "An intentional approach" is required where opportunities for connections between learning experiences are designed and modeled through pedagogy (Huber & Hutchings, 2004, p. 9). To achieve the desired outcomes, integrative learning requires coordinated efforts involving

curricula, departments, and programs to incorporate opportunities for learning to experience and demonstrate these abilities (Huber et al., 2007). Some of the best initiatives have infused opportunities for integrative learning throughout the student's academic experience (Huber et al., 2007). Integration involves not only the learning of skills but also inclination; therefore, it is associated with culture and values. The National Survey of Student Engagement found the two essential components of student engagement were student commitment to educational activities and the quality and number of opportunities for students to participate in meaningful learning activities (AUCC, 2011).

The very nature of integrative learning requires campus-wide change (Huber et al., 2007). However, it is anticipated that "students are unlikely to develop such habits of reflection and intentionality if faculty do not do the same" (Huber & Hutchings, 2004, p. 8). In the past the assumption and expectation was that students would develop this capacity almost unconsciously as a result of the educational experience (Huber et al., 2005). However, it is now recognized that reflection requires a consciousness and intentionality that has been identified as a critical learning outcome of undergraduate education (Huber et al., 2005). It has been stated that leadership must come from the top, with both faculty and student engagement being perceived as equally important, if institutional and cultural change are to occur (AUCC, 2011). Scardamalia and Bereiter (2006) suggested that higher education needs to assist students in not only acquiring the competencies of knowledge-building, but in coming to see themselves and their work as part of the effort to move forward the knowledge frontier. Blin (2004) in his study of learner autonomy advocated that the developmental nature of learner autonomy requires analysis at both the course and program levels. The undergraduate program as a whole has an important role to play in the development of the student.

Within the academic context, the challenge is to prepare students such that they have the competencies to participate in the knowledge society (Winne, 2013). Essential to undergraduate education are inquiry-based teaching and learning opportunities that foster student competencies and commitment to critical thinking, independent inquiry, ownership of the learning experience, as well as personal and intellectual growth (Lee et al., 2004). Faculty often lack a clear concept of critical thinking and as a result, instruction separates the teaching of content from the thinking skills necessary to take ownership of the content (Paul, 2005).

Huber et al. (2007) advocated that students require repeated opportunities to engage in integrative experiences to understand and internalize a concept. Integrative practices are relatively complex skills, which require significant time, effort, and experience to develop. They are not incidental processes or outcomes that emerge from course teaching or program design, but rather they require special attention by educators if students are to be integrative learners. Individual opportunities for integrative learning are not sufficient to create integrative thinkers, because internalization requires student development over the entire academic career. Integrative learning needs to be an educational outcome in higher education. It does not just happen but it requires work on the part of the student and is unlikely to occur without commitment and effort on the part of academia (Huber & Hutchings, 2004). Addressing the development of students as true learners will involve a coordinated effort and change in philosophy only possible with the support of academic leaders; and therefore the whole process must be a coordinated program-level initiative. Tagg (2010) argued to move beyond innovation to transformation required double-loop learning where the underlying assumptions and values behind the decision-making and problem-solving processes employed are examined. Double-loop learning leads to a paradigm shift.

The Place of Reflective Learning

John Dewey is credited with first articulating the concept of reflection and reflective practice (Elkjaer, 2005; Ellström, 2006; Høyrup & Elkjaer, 2006; Rodgers, 2002). Reflective practice is the conscious, thorough, and systematic meaning-making process of examining knowledge or ideas associated with past experiences for the purpose of resolving an inconsistency or problem and applying this learning to understanding new experiences (Høyrup& Elkjaer, 2006; Rodgers, 2002). Examining the underlying assumptions about what is known, and assessing the foundations and ideas of one's own scholarship and discipline need to be a priority of higher education (Pocklington and Tupper, 2002). Higher education needs to engage the learner in critical self-reflection that creates a fragile sense of self for students in a tumultuous and uncertain environment (Barnett, 2011). How the learners see themselves and their fit within the world is dependent on their sense of reality. When they are asked to examine and question the very assumptions on which that reality is based, that examination can lead to a tentative sense of identity for the students. Within an environment where knowledge proliferates,

the Association of American Colleges and Universities (2002) identified the need for students to become intentional learners. Intentional learners are integrative thinkers who can transfer problem-solving skills from one situation to another by making connections among diverse pieces and sources of information and knowledge. They must understand the purpose of learning, the learning process itself, and how to apply the skills developed through their education such that they succeed in spite of instability (p. 22). These skills are needed when the body of knowledge is growing but I would suggest there is a desire to go further to consider the dispositions necessary to deal with both complexity and uncertainty of knowledge. Disposition includes beliefs about what is reality or truth (ontology), what can be known about that reality and how it can be known (epistemology), and the values infused within the processes of knowing and learning (axiology).

In the current knowledge environment there is a need for the learner to go beyond understanding to personal ownership over learning not only in terms of content but the ways of knowing such that judgements about the relevance and value of diverse pieces of evidence and arguments are possible. The learner must undertake cognitive development that explores and expands personal ways of knowing and learning such that it is possible not only to transfer and make connections amongst existing knowledge but to transform knowledge and ways of knowing when problem-solving and learning is complex and uncertain.

I argue that the uncertainty and complexity of knowledge requires moving beyond the logical reasoning of critical thinking undertaken when problems are well defined and closed-ended (Hofer & Pintrich, 1997) to include reflective judgment that involves reasoning to consider how the learner knows as well as alternative ways of knowing (Kitchener, King, & DeLuca, 2006). Reflective judgement is necessary when a judgment about an ill-structured, open-ended problem is required (King, 2000). Reflective judgement is distinct from critical thinking in its focus on the epistemological assumptions of both the conception of knowledge and the process of justifying knowledge the learner employs in solving complex problems (King & Kitchener, 2004).

> People who reason using reflective thinking assumptions accept uncertainty in decision making but are not immobilized by it. … They believe that knowledge claims must be evaluated in relation to the context in which they are generated to determine their

> validity; that any claim should be re-evaluated in light of new data, new methodologies, and new perspectives on the question; and that they must actively construct their own decisions. (King, 2000, p.19).

Reflective thinking as conceptualized here is relevant to learning in the age of knowledge uncertainty and complexity and is discussed further in Chapter 2. Barnett (2011) suggested that a desired learning outcome of higher education should be both the development of integrative learning capacity and the promotion of students engaging intentionally with the world to allow for venturing forward in learning. Again I agree with Barnett but suggest that for learners to engage intentionally requires a shared vision of student development as a learner within academia. Equally important, is an understanding of the relationship between integrative learning as an outcome of academia and the underlying conceptions of knowledge and learning operating within higher education. I draw on Barnett's thinking regarding the purpose of learning and related challenges for both the learner and higher education.

Venturing Forward

Barnett (2011) believed the current learning environment is one of not only continual change but also that it requires acknowledging the existence of multiple frameworks and perspectives for understanding the world. The learning journey as a result is unclear. There are no rules for learning and so learning is now defined as "going on in a world in which there are no rules for going on" (p.6). Learning is the act of venturing forward in an environment of uncertainty and self-doubt. The relationship between the world and the learner grows in complexity through learning and is made tentative by the multiple frameworks and perspectives through which the world can be understood.

The implications of the age of continual change are that students in their education are forced to struggle with the insecurity of learning precarious frameworks that offer new perspectives, but at the same time bring awareness that the validity of these frameworks is continually questioned and that the world could be otherwise (Barnett, 2011).

> So it is part of the very meaning of higher education that it looks to the formation of student being that is both here and not-here. The student has his or her thoughts and actions in the here-and-now but is always aware that those thoughts and actions could be

> otherwise. And he or she also accrues the capacities to stand outside that here-and-now to self-critique those thoughts and actions. (Barnett, 2011, p. 9)

Learning brings uncertainty and insecurity about previous understandings and expectations regarding the world, and the student may question the value of the learning process and outcomes. In such an environment what would count as knowledge or knowing and how could it be known?

Barnett (2011) suggested that knowledge creates an awareness of the unknown for students. As students come to acquire a new identity within the disciplines they study, they become aware that other points of view are possible and that other frameworks through which the world can be known exist. Learning is therefore ongoing and a process of self-doubting enquiry ensues that can shape a student's identity. In the context of higher education, learning becomes learning about oneself and the role of academia is to facilitate the development of the dispositions required in venturing forward on this quest in the age of uncertainty. According to Barnett "This is no will to power but a will to explore, to engage, to enquire; and to open oneself to strangeness" (p. 12). Learning understood as a state of active doubt has implications for approaching both pedagogy and curricula in higher education, because learning is an iterative self-doubting enquiry that involves processes of examining, critiquing, and creating uneasiness with no definitive learning outcomes or end point except that of coming into active doubt and being a learner.

In the age of supercomplexity, the role of higher education according to Barnett (2011) has changed, but is still significant in student learning. Learning is an ontological and epistemological matter that contributes to the student's understanding of self or being and what can be known and not known. The kind of learning Barnett identified as necessary requires a disposition that allows the student to authentically venture into learning in the environment of tenuous knowledge, and it is in the development of these dispositions, appropriate for venturing forward in learning, that academia finds its new role. There is a need to focus consciously on the learner as an outcome of higher education, aiding students in their capacity to venture forward.

The Need for the Meta-learner

As I have argued so far, intentional learning involves "cognitive processes that have learning as a goal rather than an incidental outcome" (Bereiter & Scardamalia, 1989, p. 363) and

"offers a powerful set of ideas and tools" (Huber & Hutchings, 2004, p. 6) for learners. Intentional learning, where the learner actively engages in moving from one state of knowledge and understanding to another, requires a problem-solving framework (Bereiter & Scardamalia, 1989). Intentional learning is conceived of as internally initiated, self-regulated, goal-directed activity (Andre & Windschitl, 2003). To be a skilled learner requires ongoing critical thinking about the process of learning (Paul, 2005). These cognitive processes and capacities are elements of the process of reflective inquiry.

Pocklington and Tupper (2002) suggested that reflective inquiry involves reflection on the human condition and on scholarship that transcend specialization within a discipline. Reflective inquiry contributes to wisdom and learning because it facilitates the achievement of largeness of vision (p. 58). It places current understandings in the context of past ones, and it requires constant evaluation of one's own strengths and weaknesses as a scholar (p. 92). Further, reflection contributes to the integrative learning and critical thinking skills students need to be intentional learners.

Implicit to reflective inquiry is an awareness and consideration of the processes of one's own learning referred to as metalearning. Metalearning is thinking about how a person learns and considering what it means to learn something (Jackson, 2004). Biggs (1985) developed and defined metalearning based on a belief that when people have knowledge of how they learn, they can proactively manage and regulate their learning. Metalearning is a metacognitive process by which learners determine their approaches or processes for learning, which determine the outcomes of learning (Biggs, 1991). It is learning about learning for the purpose of taking control of the process to think, and to act on one's thinking, in such a way that desired learning outcomes are achieved, and as such is the knowledge that enables an individual to be a more effective learner (Jackson, 2004). Metalearning capacity has been empirically proven to be associated with reaching personal understanding in learning and central to a commitment to student learning empowerment (Meyer, 2010).

While intentional learning requires the learner to be purposeful and able to monitor and regulate learning (Vosniadou, 2003), the concept of metalearning, which has similar goals, adds to this notion both the ambition to understand how learning happens as well as to recognize and develop oneself as a learner. Metalearning that incorporates an understanding and contemplation

of how one learns, and of identity construction as a learner, is critical in the age of knowledge complexity and change where the individual experiences continual self-doubting as part of the learning process.

While the term intentional learner has been used in the literature and academia to describe the integrative thinker, the word intentional implies purpose and direction, and a known destination. It implies like critical thinking that the learning will follow some logical path and have closure. Learning as Barnett (2011) described it should have no points of closure but instead should be a process to achieve the continual opening up of the self to a state of radical doubt. I offer the term meta-learner to articulate how in an environment where knowledge has no boundaries there is a need to understand one's own ways of knowing and learning so that learning can be understood and undertaken as opening oneself up to the possibilities of knowledge uncertainty and complexity. The meta-learner becomes comfortable with an identity as a learner that engages uncertainty and complexity. Meta as defined in the dictionary means beyond, transcending, encompassing, and change transformation. In the current environment of knowledge without boundaries, learning is about transformation of the self through exploration, reflection, and self-doubting.

Rendón (2009) suggested that there are two interpretations of integrative learning. The first, which has been used here to describe the intentional learner, involves learning for the purpose of connecting knowledge from diverse sources across disciplines. However, Rendón offered a second, alternative perspective on integrative learning that "recognizes connections among diverse ways of knowing but also emphasizes the relationship between mind, body, and spirit, and the connection between the outer life of vocation and professional responsibility and the inner life of personal development, meaning, and purpose" (p.134).

The construct of meta-learner encompasses personal development related to exploring ways of knowing and understanding. Awareness of the purpose and ways of learning as well as the personal ownership of knowledge and knowing are understood by the meta-learner to be essential to personal development and instrumental to understanding self, others, and the world. There is recognition that a commitment to undertaking learning includes examining the processes employed in learning and the implications for what constitutes knowledge and how that knowledge is understood and known by the learner. The meta-learner develops and engages in

the cognitive capacities of transforming knowledge to imagine and explore possibilities beyond the current state of knowing. It is through this sense of self as a learner that the meta-learner finds meaning and purpose in learning in an environment of uncertainty and self-doubt. The second view of integrative learning offered by Rendón captures the desired learning capacity of the meta-learner and is adopted here as the understanding of the term integrative learning going forward.

The realization that through the learning process what can be known is continually altered, alternate ways of knowing the world exist, and knowledge has no boundaries represents a significant complexity of the context for learning in the knowledge economy. The recursive nature of knowledge and knowing within learning creates an imperative for the meta-learner as an educational outcome. It has been noted that while academic institutions have entire organizational units devoted to learning skills, they have not embraced the skills of learning or metalearning as part of the educational mandate related to student development as a learner (Meyer, 2010; Meyer & Shanahan, 2004). An individual's conceptions of knowledge are instrumental to the strategic learning process (Hofer, 2004) and in particular the functions of higher-order thinking and problem solving (Kardash & Scholes, 1996).

Academic leaders have identified an imperative for student development as intentional learners but have seen limited success in achieving this outcome in a meaningful way. The inability to address the problem suggests a need to examine the underlying conceptions of knowledge and learning operating in support of the approaches employed in both teaching and learning in higher education. By undertaking a study of the conceptions and fundamental approaches to learning one can explore the core belief systems fuelling the academic learning experience. How students and academic programs conceive of knowledge, learning, and the learning process has implications for student learning and student development associated with becoming a meta-learner. A conceptual study is required to understand the epistemological beliefs that support becoming a meta-learner. Through an examination of the multiple frameworks that may be employed in teaching and learning one can begin to understand the extent to which each framework accommodates the complexity of the learning environment and the development of students as meta-learners in higher education.

Purpose of the Study

In this conceptual study I examine how learning may facilitate the development of students as meta-learners by first examining personal conceptions of knowledge and knowing, and by exploring how three broad conceptions of learning may contribute to understanding what is required for student development. How current learning theory may constrain teaching and learning as higher education moves beyond intentional learning to supporting students in becoming meta-learners is significant. I consider how learning might be thought about to accommodate the meta-learner as an academic outcome in the age of self-doubting and knowledge complexity.

Research Questions

What is the anticipated personal conception of knowledge and knowing of the meta-learner? What contributions do theories of learning make to understanding the development of students as meta-learners in higher education? How might one rethink learning in academic programs to accommodate the meta-learner?

Significance of the Study

Given the broad implications of promoting the meta-learner as an academic outcome, the issue warrants discussion and debate at the conceptual as well as the empirical level. Understanding the personal epistemological beliefs of all participants in the learning experience is essential to understanding the perspective of the learner and it offers a starting point for exploring barriers to effective learning (Schommer-Aikins, 2002). How academic programs can influence the development of students as meta-learners requires an understanding of the knowledge creation and learning processes involved.

In an applied sense all learning involves making judgements about what is reality, what can be known about truth and how it can be known, as well as the value or meaning of that truth. The ability to achieve learning outcomes such as intentional learning will hinge on these judgements by participants in the learning experience. How basic belief systems being unstable, interactive, dialectic, and recursive affects learning, learning processes, teaching, and learning outcomes within academic programs, requires further examination.

Paavola and Hakkarainen (2005, p. 553) argued the epistemological and ontological issues were important for the ways of knowing, conceptions of knowledge and learning, identity,

belonging, and social acknowledgement and respect for the reality of others. Understanding learning as primarily creating a sense of flux or instability both in terms of what is reality, what can be known, and how it can be known, provides a perception of ontology and epistemology not explicitly accounted for in established learning theory. By first examining the underlying epistemological and ontological assumptions of the meta-learner, one can begin to explore the ability of the higher education learning experience to address the learning imperatives identified as essential for student success in a knowledge driven society.

Huber et al. (2007) stated that the challenge for academia is to find ways to help students make the larger leaps of imagination necessary to connect ideas and domains (p. 46). Barnett (2011) suggested uncertainty and self-doubt as outcomes of learning are essential to the process of learning, where the goal is moving from one place of limited understanding to another place of greater understanding. Barnett advocated that the learning objective of radical doubt has implications for teacher-student relationships, student development, learning processes and opportunities, and relationships between learners. Given the ontological and epistemological assumptions that Barnett presented, the issue of how learning occurs, including the relationship between the individual and social context for learning, needs to be further explored. A contribution of this work will be conceptualization of the relationship between the meta-learner and learning when distinct learning theories are assumed to be operational; and the implications of each underlying belief system for facilitating the development of the student as a meta-learner.

Reflection is considered to be an essential component to learning (Berry, 2011; Ellström, 2006; Høyrup& Elkjaer, 2006; McDermott, 1999; Parboosingh, 2002; Raelin, 2001; Rodgers, 2002). Transformative reflection uses theory to address problems and move from a current unsatisfactory reality to a more desirable and workable state of being (Biggs & Tang, 2011). The epistemology described by Barnett (2000; 2009; 2011) requires reflection on learning and pedagogy in higher education. He stated that new knowledge is created through reframing. This study is a form of transformative reflective inquiry in that through reframing learning and the learning process, I conceptually examine learning for the purpose of strengthening the understanding of how academic programs might contribute to the development of students as meta-learners. The contribution I make lies in first examining how existing learning theory can inform the discussion of the capacities of the meta-learner as an academic outcome, and in then

contemplating learning for the development of the student as a meta-learner in an environment of knowledge complexity and uncertainty.

Definitions

There are several concepts that require a definition to clarify my application of these terms within this dissertation. I am not defining here all concepts used but rather those that have a particular meaning within this context and are particularly germane to my topic. Other terms are defined as I develop my ideas and thinking about learning in higher education.

Integrative learning is understanding and connecting diverse perspectives and ways of knowing, and involves bridging the social world of learning with "the inner life of personal development, meaning, and purpose" (Rendón, 2009, p. 134). It is dependent on the ability to analyze and connect disparate pieces of information and knowledge, making these connections between experiences and activities, disciplines, and contexts.

Intentional learning is integrative learning with a raised consciousness such that learning through connections is conceived of as an outcome and there is an awareness of the purposefulness of learning and the learning process. I use the term to describe the desired outcome of higher education, because it incorporates not only the skills of integrative learning, but also what Barnett (2011) termed the student's intentional engagement with the world. It is choosing to act with a sense of purpose for enlargement of experience, having the motivation to move beyond the current state of being to become different through cultivating personal capacities (Greene, 2000). This intentional engagement with learning happens in spite of the uncertainty and unknown possibilities of learning.

A **meta-learner** is an individual with the capacity for intentional learning or as Huber et al. (2007) stated the "integrative habits of mind" (p. 48). It implies a transformation, an internalization of the ability and processes of integrative learning such that it becomes part of the sense of self or identity as a learner. The meta-learner understands that learning opens up possibilities and engages as part of the learning process in imagination with the purpose of identifying new possibilities for knowledge through integrative and reflective practices.

Assumptions

I assume that underlying beliefs about knowledge and knowing are reflected in conceptions and methods of teaching and learning in higher education, which influence student

learning and learning outcomes (Fullan, 2007). In a recent review of literature on promoting change in instructional practices used in undergraduate science and math courses the authors found that successful strategies for changing curriculum and pedagogical practices focused on creating conceptual and belief change in faculty (Henderson, Beach, & Finkelstein, 2011). I accept and draw on Barnett's (2011) premise of a knowledge world of uncertainty and unpredictability where belief systems are tumultuous and engaged in a recursive relationship with learning. Implicit is my assumption that becoming a meta-learner is a desired student outcome of academic life.

Positionality

As the facilitator of a web-based research methods class, I am fascinated by the dominance of the consumption model of learning and research among natural science students, who see research as having limited relevance to their future professional careers. Given the exponential rate of change in science I believe that these students not only need to be able to understand and construct meaning from research, but to critically reflect on its application to everyday problems and to apply it on a daily basis.

As the mother of two children I have attended many parent-teacher interviews where I am met with blank stares when I appear unimpressed that my child is at the top of her class and express an interest instead in my child becoming a good student. I sat outside my daughter's math classroom and read the words *The primary question is not what do we know, but what do we do with what we know*. I thought how true and yet I wonder how many high school teachers ever talk to their students about what to do with the information imparted on them or better yet ask students to imagine what possibilities knowing might create for them?

One of my daughter's teachers was pleased to tell me about his experience in post-secondary teaching and the processes he employed to allow high school students to practice integrated learning and critical thinking. While the teacher went into great detail explaining the assignments and anticipated outcomes related to student learning activities, when I asked about whether he talks to the students explicitly about integrated learning and critical thinking and the rationale for the learning activities and his approach to teaching, he seemed surprised and uncertain how to answer me. He indicated there was an indirect way to teach these skills and a direct or explicit approach as I was suggesting and the indirect approach using experiential

learning was more effective than trying to explain it to the students directly because of the complexity of the desired cognitive skills. What he implied is that we cannot talk to high school students about why they are learning, how they are learning, or the way they think about problems because he seemed to believe these concepts are beyond their comprehension.

If students are unable to understand the concepts, they may be undertaking the processes associated with integrated learning, but they do not understand the processes related to integrated and critical thinking. I maintain that without understanding, it is unlikely they would be able to transfer that learning to another situation as intended. I wonder why educators feel they cannot trust children to take control and ownership over both their learning and their ways of knowing. Educators expect students to understand their own ways of knowing simply by doing, without any sort of reflection on the way they personally make meaning from the knowledge. If the purpose of learning is to develop the skills and the thought processes necessary for undertaking integrated and critical thinking, the "why" and "how" questions related to learning and knowing need to be articulated and understood by the students in order for these skills to be internalized and applied to other learning situations in the future.

I assert that although students need to acquire an abundance of information, they just as importantly need to develop competencies related to critical thinking and reflection. Students need to experience ownership over the process and content of their learning. Ownership of the learning requires beliefs and attitudes that value learning in an environment of knowledge uncertainty, as well as a personal understanding of the possibilities engaging in learning create for the learner. In addition, students need to develop a sense of themselves as self-directed knowledge creators and learners. Students will have access to abundant sources of information with the click of a mouse for their entire life, but what they need when departing the education system are the competencies and confidence to be able to tackle diverse problems. Learners will need to be able to identify what question to ask, to evaluate the alternative opportunities for answering that question, and to methodically undertake the steps to do so. The traditional career of one job in the employee's area of training with one employer has become almost non-existent and has been replaced with the changing career (Kuijpers & Scheerens, 2006). As academia moves away from what I term academic or scholarly opportunities toward more technical skill building tasks, they are also moving away from learning that has as its goal the opening up of the

mind to multiple ways of understanding, interpreting, and creating meaning. I postulate this form of learning is necessary to solve the unknown problems of the future.

Wenger (1999) described learning well: "It is that learning – whatever form it takes – changes who we are by changing our ability to participate, to belong, to negotiate meaning" (p.226). He added the following statement regarding education:

> Education, in its deepest sense and at whatever age it takes place, concerns the opening of identities – exploring new ways of being that lie beyond our current state. Whereas training aims to create an inbound trajectory targeted at competence in a specific practice, education must strive to open new dimensions for the negotiation of the self. It places students on an outbound trajectory toward a broad field of possible identities. Education is not merely formative - it is transformative. (p.263)

I once asked a department head what he believed was an appropriate undergraduate degree for someone looking to enter medicine. His reply was "philosophy, it teaches you to think." So where higher education has become more specific, more applied, moving toward more real-world problem solving to develop professionals, are there still opportunities in these educational programs for students to develop with respect to broadening their thinking as learners? It is not possible to provide students with the answer to all the problems they will encounter in their professional lives, so perhaps it would be better to provide them with the competencies to identify the problems and confidence to find the answers. How might the conceptions of knowledge and learning employed and cultivated in academia influence the student's capacity to meet the challenges of knowledge complexity and uncertainty?

Organization of the Dissertation

Drawing from an examination of the existing approaches to knowledge creation and its related learning frameworks, I consider a conceptual framework of learning that accommodates the ontological and epistemological imperatives accompanying the notion of the meta-learner as an academic outcome. I explore the implications of three broad perspectives for learning by evaluating the individual, social constructivist, and activity theories of learning. In figure 1-1 I demonstrate the processes linking both the meta-learner's conceptions of knowledge and existing understandings of learning with the development of a new conceptualization of learning.

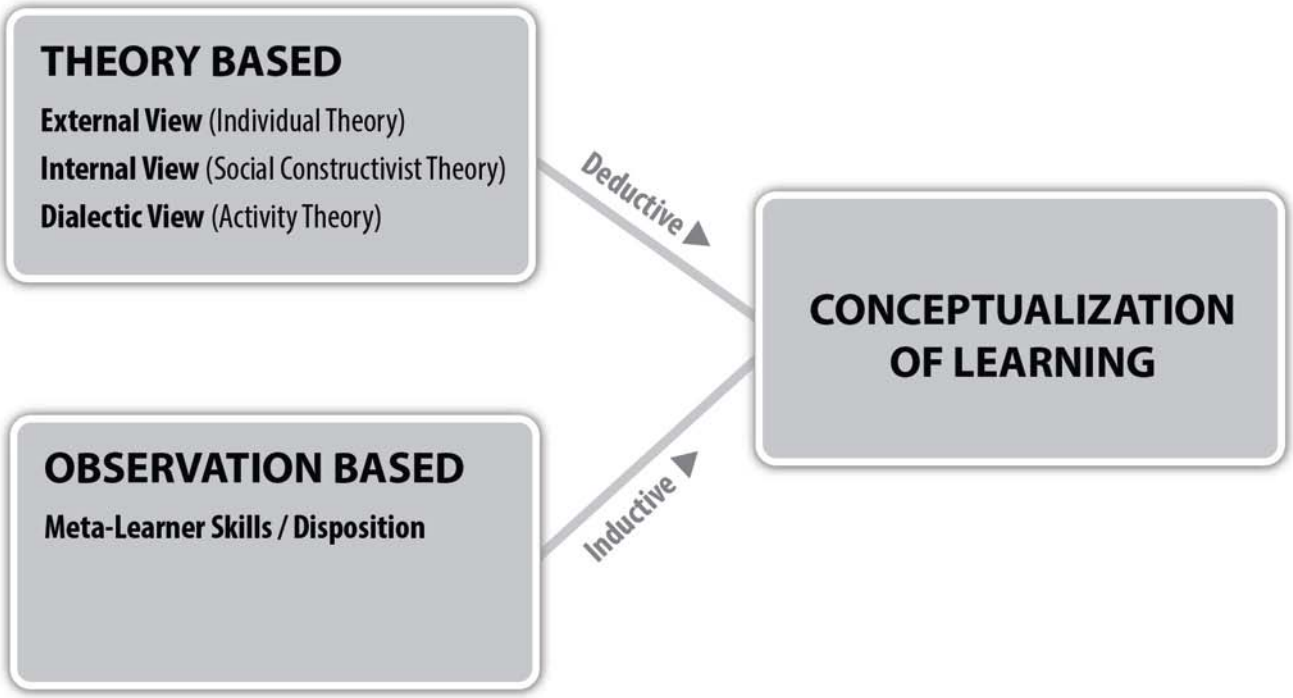

Figure 1-1. Methodology for rethinking learning

The current environment of knowledge complexity and uncertainty creates an imperative for the student to develop the capacities of a meta-learner in which the earner has a disposition, including personal conceptions of knowledge and knowing, that can contend with knowledge complexity and uncertainty. I employ both inductive and deductive analysis within this study. Drawing on real world experiences and observations to inform constructs of learning constitutes inductive inquiry. Examining existing learning theory is a form of deductive inquiry that is employed here to facilitate understanding of current conceptions of learning and inform the development of a framework for learning that has as an academic outcome supporting students in becoming meta-learners. Understanding the relationship between the underlying conceptions of knowledge the learner brings to the learning experience and existing learning theories provides the basis for considering a new framework for learning.

In Figure 1-2 I offer a visual guide to the structure of my dissertation.

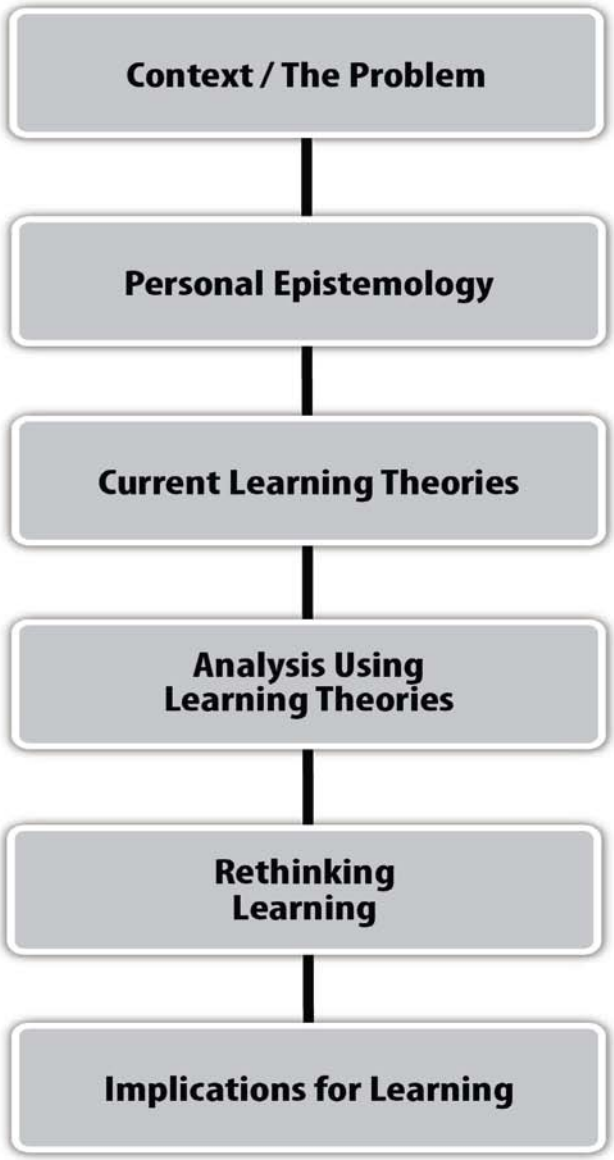

Figure 1-2. Structure of the dissertation

In Chapter 1 I summarized the environment for learning in higher education and discussed the need to rethink learning in the knowledge economy. I identified the imperative for the meta-learner as an academic outcome of higher education, and I presented the purpose and significance of the dissertation.

In Chapter 2 I consider the personal conceptions of knowledge and knowing associated with the meta-learner. I examine these beliefs through a review of personal epistemology, and I discuss the implications for learning.

I review in Chapter 3 selected literature on knowledge creation and learning theory, and I identify conceptual models of what learning is and how it occurs.

Within Chapter 4 I explore the capacity of each of three perspectives of learning for facilitating development of the student as a meta-learner. I consider the implications of assuming personal epistemological development is a desired outcome of academic learning within each model, and I discuss the need for each framework to address the knowledge complexities of the current era of learning.

Based on the examination undertaken in Chapter 4, I consider in Chapter 5 the relationship between the meta-learner and learning when knowledge is uncertain, complex, and changing. I offer a conceptualization of learning when the meta-learner is a desired academic outcome.

In Chapter 6 I discuss what I believe are the connotations of this new conception for learning for academic programs in the age of uncertainty and self-doubt. I reflect on the potential theoretical contribution and implications of this research, and offer conclusions from this work as well as insights for future research.

CHAPTER 2

CONCEPTION OF PERSONAL EPISTEMOLOGY: THE ESSENCE OF KNOWING

> Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends constitutes reflective thought. (Dewey, 1933, p. 9)

Learning, as I have discussed in Chapter 1, is an ontological and epistemological matter, guiding and shaping what the learner perceives to be real and what can be known while contributing to the development of the student and the student's understanding of self. Bereiter and Scardamalia (1989) argued that assuming the student is actively engaged in the learning, personal theories of what knowledge is and how knowledge is acquired will be relevant (p. 367). Learning understood as the process by which meaning is applied to information and knowledge is created; and personal epistemology understood as how people think about knowledge and about knowing; together will have implications for how the learner comes to know and therefore will significantly influence learning. Personal epistemology is the essence of how the learner knows. Learning goals and processes are guided and constrained by the student's beliefs about the nature knowledge and how the individual comes to know (Mason, 2003).

The capacity of learners to interpret and evaluate information in the decision-making process of complex problems is influenced by epistemological thinking and development (Hofer, 2001; Khalifah & Rallis, 2010). The personal epistemology employed by the learner determines the approach to thinking used and therefore controls the ability to initiate reflective thinking necessary for knowledge creation (Mason, 2003). Before evaluating the anticipated relationship between the development of students as meta-learners as an academic outcome and the learning theories that might be employed in academia, I believe it is useful to consider the disposition of the meta-learner. Some of the skills and cognitive abilities associated with the meta-learner have epistemological implications related to beliefs about knowledge and knowing.

In Chapter 1 I identified the need for the meta-learner and integrated learning that involves making connections between diverse ways of knowing in the external world, as well as internalizing this knowing to integrate it with personal meaning-making and development. The need for personal development to be part of learning that explores ways of knowing and

understanding is essential when knowledge has no boundaries. In this chapter, I introduce personal epistemic beliefs related to the nature and source of knowledge, the certainty and justification of knowledge, and the relationship between epistemic beliefs and learning. I explore the specific epistemological views employed by the meta-learner. As the starting point for considering the development of the student as a meta-learner within existing learning theory, I discuss personal development of the meaning-making capacities necessary for ownership over the learning experience, for student identity as a meta-learner, and for meaningful engagement with other learners.

The meta-learner is an identity, a sense of self as a learner that requires beliefs about knowledge and knowing capable of engaging in learning in the age of knowledge complexity and uncertainty. These beliefs are associated with a disposition open to exploring ways of knowing through reflection and self-doubting, including examining the processes of learning itself. The meta-learner actively engages in cognitive processes to transform knowledge and knowing such that it is relevant and meaningful within a context but also considers adaptation beyond that context across domains and subject matter. Awareness and management of personal thoughts, or thinking about thinking, is referred to as metacognition (Kuhn & Dean, 2004). While metalearning describes thinking about the process of learning undertaken by the learner, meta-learner moves beyond skill acquisition to a disposition that internalizes a framework for learning that involves taking ownership over authoring, acting upon the possibilities offered by a learning experience. Through an understanding of these desired beliefs and cognitive skills and how they are thought to change and develop it becomes possible to consider how particular learning theories may contribute to facilitating these developmental processes.

Metacognition

Jackson (2004) described metalearning as thinking about how one learns and metacognition as the higher order thinking associated with the cognitive processes involved in thinking and in acquiring knowledge, or the act of learning. Metacognition involves thinking about thinking and therefore encompasses learning about learning making metalearning one manifestation of metacognition. Metacognitive knowledge is acquired when learners come to understand their own cognitive processes within the context of learning (Wenden, 1998). Metacognitive strategies refer to strategies about learning rather than the learning strategies

themselves (Cook, 1993 in Jackson, 2004). Metalearning is critically linked to metacognition, to self-identity as a learner, and to reflection as a process for achieving self-awareness as a learner.

Meta-learner adds to the concept of integrative thinker the capacity for insight regarding the purpose and practise of learning, leveraging this knowledge about learning to take ownership of the process and of the outcomes of learning. The meta-learner recognizes the personal investment and sense of agency involved in learning. Ownership over learning requires personal development in terms of how knowledge is constructed and known.

Personal Epistemology as a Metacognitive Process

Personal epistemology is a metacognitive process described as the way that an individual thinks about knowledge and knowing (Hofer, 2004). Epistemic views are beliefs about the nature of knowledge and knowing. These beliefs include what counts both as knowledge and as a source of knowledge, the certainty of knowledge and knowing, how knowing occurs, and the justification for knowledge including how it is constructed and evaluated (Hofer, 2004; Mason, Boldrin, & Ariasi, 2010). Personal epistemic thinking and development influence individual interpretation and evaluation of information (Hofer, 2001). How an individual undertakes and develops these processes is critical to the outcomes of learning and problem solving as well as the ability to engage in reflective judgment. The development of these processes becomes an important consideration for the conceptualization of learning within higher education. There are three conceptual approaches to the study of personal epistemology: multidimensional epistemological belief systems, domain specific theories, and personal developmental models (Hofer, 2001; 2002; Hofer & Pintrich, 1997).

Belief systems approach

The belief systems perspective of personal epistemology involves a relatively independent set of beliefs about knowing and learning. Hofer and Pintrich (1997) proposed that there are four dimensions to epistemological beliefs including certainty of knowledge, simplicity of knowledge, sources of knowledge, and justification of knowledge. Certainty can range from absolute and unchanging to tentative and evolving. Simplicity refers to whether knowledge is isolated pieces of information versus highly integrated ideas. Sources of knowledge are considered on a continuum from external, and only from designated experts, to being constructed socially and contextually by the learner. Justification for knowledge ranges from involving

observation and empirical evidence to undertaking inquiry that integrates input from multiple sources and is evaluated contextually.

Schommer-Aikins (2004) introduced a personal epistemology model that also outlines a specific belief system. The model assumes a belief system based on the understanding that epistemological conceptions like beliefs have the characteristics of being difficult to change, being separate from logic, and being of significant influence on thinking. Five dimensions of beliefs have been identified: structure, stability, source of knowledge, control of knowledge acquisition, and speed of knowledge. Structure, refers to whether knowledge is simple, isolated pieces of information, or highly integrated concepts. Stability involves the certainty of knowledge ranging from unchanging and stable to tentative and evolving. Beliefs about what constitutes a source of knowledge range on a continuum from experts identified as having the ability for knowledge generation to basing legitimacy on reason and empirical evidence. The ability to acquire knowledge is perceived to be either established by fixed intelligence at birth or to be developed through learning. Knowledge acquisition can be conceived as occurring quickly if at all or as being a gradual process.

Domain specific approach

Domain specific theories are based on the assumption that instead of individuals having one set of views about knowledge and knowing, beliefs about knowledge are contextual and may change depending on the field the learner is working in (Hofer & Pintrich, 1997). A learner's beliefs about knowledge and knowing are a collection of personal theories with each theory representing a separate integrated set of propositions that may be utilized within a specific context (Hofer, 2001). For example in the domain of natural science, an individual may consider knowledge to be in the form of a single, certain truth held by experts and verified only through empirical experiments while this same individual may view knowledge within the humanities as more contextual, uncertain, socially constructed, and subject to interpretation and to debate.

Personal development approach

The area of individual development theory has had the largest amount of work and resulting model development, (Hofer & Pintrich, 1997). The concept of epistemological development in the individual was first described by Piaget (1972) as *genetic epistemology*, and involves six stages of intellectual development. Knowing or epistemology was linked through

Paiget's (1971) work with psychology and with the concept of cognitive structures used to make meaning of experiences. Piaget (1971; 1972; 1973) introduced the concept of assimilation to describe the situation where learners simply incorporate new experiences into existing structures and the concept of accommodation to refer to when the new experience did not fit well within existing experiences. When new experiences could not be reconciled with old ones, assimilation was not possible; but instead the individual was required to alter the existing cognitive structure to maintain what Piaget referred to as equilibrium.

Perry (1970) was the first to undertake a psychological study of epistemological beliefs and to postulate a developmental model of knowledge and knowing. Four categories representing the development of how the individual perceives knowledge and learning were identified. The first developmental position is the dualistic perspective where knowledge is definitively right or wrong. At this stage the teacher transfers the information generated by experts to learners. From the dualist position the learner begins to move to multiplism where the existence of multiple perspectives is understood and where the possibility of uncertainty in knowledge can be entertained. The learner progresses within this stage from being initially focused on how to learn and how to seek out the right answer to eventually being an independent thinker. The next move is to the position of contextual relativism where the individual is aware of the validity of conflicting views. Within contextual relativism the learner undertakes an internal evaluation of the alternatives to arrive at a judgment about the value of a particular perspective based on the evidence relevant to a specific context.

Perry's (1970) work was followed by four other individual development models based on the assumption the individual moves through a series of conceptions about knowledge and knowing for the purpose of facilitating both the learner's capabilities and complexity of meaning-making (Hofer& Pintrich, 1997). Although not always labeled as distinct stages these models generally advance the individual from a state of viewing knowledge as exclusively objective through a conception of knowledge and knowing as subjective to eventual understanding of the relative merit of evidence (Hofer & Pintrich, 1997). When this stage of understanding is reached the individual believes truth to be evolving, employing the process of evaluation to the construction of knowledge and to the consideration of alternate ways of knowing (Hofer & Pintrich, 1997). I briefly describe here four models of epistemological

development outlined by Hofer and Pintrich (1997): women's ways of knowing, epistemological reflection, reflective judgement, and argumentative reasoning.

Women's ways of knowing. Belenky, Clinchy, Goldberger, and Tarule's (Clinchy, 2002; Hofer, 2001) work on women's ways of knowing identified a progression of integration and coordination between the objective and subjective means of knowing. The learner moves from a position of receiving knowledge (similar to Perry's dualism) through subjective knowledge (Perry's multiplism) to procedural knowledge. Two different epistemological approaches are available with procedural knowledge: one of connected, empathetic, and caring knowing; and the other of separate, detached, and impersonal knowing. When these two orientations are integrated, the individual moves to a new position of constructed knowledge. Individuals become connected knowers when they are able to actively listen to the reality of others. This active listening allows for the creation of bridges between multiple perspectives to facilitate mutual appreciation for the alternate ways of knowing by the learners. Connected knowers remain open to the influence of those alternate realities on their own subjectivity (Clinchy, 2002).

Epistemological reflection. The epistemological reflection model that was developed by Baxter Magolda (2004) assumes individuals undergo a socially constructed and context-bound epistemological transformation involving a shift by the learner to more complex epistemological assumptions. Personal epistemology under this model is based on the nature of knowledge including dimensions of complexity, certainty, and source. Baxter Magolda's model encompasses beliefs about self, learning, instruction, and domain-specific knowledge. The individual moves through four ways of knowing. Beginning with absolute knowledge, where the learner assumes what can be known is certain and held by designated domain experts, the individual moves through a transitional phase, where knowledge becomes absolute in some domains but tentative in others, and eventually progresses to the independent way of knowing. At the independent level of development, the individual searches for understanding of what is perceived initially as primarily uncertain knowledge. Eventually the learner knows it as contextual knowing, where knowledge is bound by the context and must be judged based on the evidence relevant to the domain. The requirement for judgment shifts the learner from external validation to internal decision-making and meaning-making.

Reflective judgement. King and Kitchener (2004) offered another model based on a cognitive developmental approach referred to as the reflective judgment model. This model emphasizes understanding how individuals construct meaning from their experiences. The model has seven stages moving through three levels of development including pre-reflective, quasi-reflective and reflective. The reflective judgement model assumes the individual's framework for interpreting experiences develops over time, growing in complexity, in integration, and in comprehensiveness. Progression through the stages to maturation is not assumed to naturally occur but is instead dependent on appropriate support and opportunities for growth. Reflective judgment, the highest level of reflective thinking, is distinguished from critical thinking in that it involves cognitive processes associated with open-ended problem solving. This problem solving is based on the consideration of one's epistemological assumptions in light of the evidence, remaining open to ongoing inquiry and to re-evaluation of the problem given knowledge is complex and changing.

Argumentative reasoning. Kuhn (1999) was interested in the implications of epistemological development for the thinking and reasoning skills necessary to support arguments when problems are unstructured. The development of cognitive competencies by the learner is considered a prerequisite to the capacity for critical thinking. The metacognitive skills referred to as meta-knowing involve knowing about one's own and others' knowing. The three categories of meta-knowing that may be employed in critical thinking include: metacognitive knowing or knowing about knowledge as an object; metastrategic knowing involving knowing about knowing as a process; and epistemological meta-knowing that questions how it is possible to know and how one personally knows.

Personal epistemology and the meta-learner

When problem solving is complex and requires the integration and evaluation of knowledge from multiple sources, individuals must make judgements about what constitutes knowledge, about the nature of knowledge, and about how to justify knowledge claims (Ferguson, Bråten, & Strømsø, 2012). Kuhn's (1999) levels of epistemological understanding along with King and Kitchener's (2004) reflective judgement model are both considered further here for their relevance to the development of the desired cognitive skills of the meta-learner.

Both models advocate reflective judgement as necessary for learners to address the unstructured problems associated with knowledge uncertainty and complexity.

Kuhn (1999) proposed that metacognitive development was essential to critical thinking. Metacognitive skill development involves increasing awareness and control over the thought processes employed when engaging in knowing the world. Those with well-developed metacognitive skills both understand and control, what and why they know in the way that they do. To achieve this understanding and control requires development through four levels of epistemological understanding. Each level is associated with specific beliefs about how assertions about truth are to be evaluated. Within each level the role and value of critical thinking is different.

Beginning at the realist level the individual considers reality to be directly knowable and knowledge to be certain and externally held by experts. Any claims made are assumed to be representations of an external known truth about reality and critical thinking is unnecessary. In moving to absolutist the individual becomes aware that statements made may be true or false and requires critical thinking to determine the truthfulness relative to the known reality. As the individual comes to be aware of conflicting views of knowledge and truth amongst the designated experts the assumption that reality can be known may be questioned and there is movement to the multiplist level. At the multiplist level knowledge is understood to be a creation of the human mind and to be tentative. The perspectives of others are assumed to be opinions of equal value and critical thinking to determine the truthfulness and the validity of those perspectives relative to any external standard or evidence is unnecessary. Kuhn (1999) argued that developing competence in all forms of meta-knowing allows the learner to move to the evaluativist level of development where there is a balancing between the objective and subjective aspects of knowledge and knowing. At this level statements about reality are assumed to be judgments made by individual after objectively considering and weighing the subjective nature of knowledge and knowing. Critical thinking that utilizes consistent criteria of argument and evidence is essential to this evaluation process.

King and Kitchener's (2004) concept of reflective judgement adds to the examination of critical thinking and reasoning by advocating that when problems are ill-structured appraisal of alternative perspectives requires the individual to be able to evaluate available relevant evidence

drawn from multiple contexts. Ill-structured problems make it necessary for the individual to take on the role of inquirer and through the process of inquiry the learner becomes responsible for the construction of knowledge. Reflective thinkers acknowledge that in an environment where knowledge is uncertain and changing conclusions are made on the application of the most relevant evidence and argument, and that these conclusions and knowledge claims are open to re-evaluation through ongoing inquiry (King & Kitchener, 1994). Inquiry is an iterative process as new data and perspectives emerge in support of new knowledge construction and reconstruction (King & Kitchener, 1994).

Reflective judgement moves the individual beyond formal reasoning to the contemplation of ways of knowing in the face of uncertainty, and establishes pathways for addressing ill-structured problems based on substantiated arguments and on the relevance of available evidence (King & Kitchener, 2004). Evaluation takes into consideration both what thought processes were employed in formulating the opinions and how consistently the criteria for judging evidence were applied (King & Kitchener, 2004). Critical thinking uses inductive or deductive reasoning and employs a linear set of steps of logic within a single frame of reference. In contrast, the act of reflective judgement goes further than critical thinking to involve metacognitive strategies with the learner acknowledging epistemic assumptions are central to recognizing and to assessing a problem.

Kuhn (1999; 2001) argued that at the absolutist and at the multiplist levels critical thinking, involving consideration of arguments and evidence to make judgements about the relative truth of those claims is irrelevant. At the absolutist level the individual believes knowledge is certain and readily available and therefore evaluation of alternative subjective truth is not required. At the multiplist level knowledge is uncertain and all knowledge claims are equally valid such that consideration of arguments and evidence to make judgements about relative truth by the individual is unnecessary. It is only at the evaluativist level where the individual must make judgements about the relative merit of alternative perspectives of the truth that thinking and reasoning are recognized as essential supports for beliefs and action. Individuals need to develop to this level to understand the relevance of critical thinking and engage in it. In an environment where knowledge is complex, uncertain, and changing, it is

essential for the learner to undertake critical thinking for the purpose of evaluating and comparing perspectives based on criteria of argument and evidence.

Kuhn and Dean (2004) argued at the absolutist level when facts are certain and easy to obtain the incentive to engage in inquiry would be limited. Similarly at the multiplist level where all claims are equally valid there would be little value in evaluating the worth of any claim through inquiry. It is only at the evaluativist level that critical thinking is anticipated to have value in evaluating and making judgments related to the assertions made by others. When there is a perceived value in evaluating alternatives and judging relative merit of truths, the individual has a reason to engage in sustained intellectual inquiry. For the meta-learner developing to the evaluativist level brings an awareness of the purpose of learning that makes it possible for the learner to commit to exploring through inquiry alternate ways of knowing and understanding.

Kuhn (1999) argued that by employing the three forms of meta-knowing it becomes possible for learners through critical thinking to take ownership and control over their personal evolution as thinkers. Metacognitive processes allow the individual to reflect on what is known, and on the justification of knowledge, while metastrategic skills allow for the management of one's own thinking processes. The third form of meta-knowing, epistemological understanding, is associated with a more conceptual understanding of thinking and knowing in general. Development of meta-knowing capacities, and the underlying epistemological understanding, is a prerequisite for achieving personal ownership of knowledge and of knowing, and for achieving understanding of the perspectives of others. For the meta-learner in an environment where knowledge has no boundaries there is an iterative relationship between ontology and epistemology as the personal beliefs and sense of self are both reshaped through learning. For the learner to understand and take ownership of the iterative learning process requires strong meta-knowing capacities.

Ownership of knowing

The individual must have beliefs about the nature of knowledge and knowing that allow the learner to engage in the metalearning necessary for knowledge transformation (Mason, 2003). The Meta-learner employs an approach to learning that is open to considering alternate ways of knowing, is receptive to alternative, conflicting opinions or ideas, and is willing to seek out counter evidence for deliberation. Learners understand the basis of personal decisions and

judgements while continually exploring alternate approaches to knowing. Rather than simply understanding what they think, meta-learners strive to understand how they and others think about problems and issues, taking into consideration the criteria employed in comparing the quality of alternative explanations. The meta-learner understands and takes ownership of his or her personal role in constructing knowledge, and in decision-making about what is believed to be true. It is the learner's ownership and control over the process of learning that makes it possible to challenge knowledge claims. Ownership of the processes of thinking and learning, and the ability to use this ownership to construct knowledge and new ways of knowing are essential when the learner is faced with knowledge complexity, uncertainty, and change. Cognitive development is essential to an individual being capable of the reflective judgement required to take ownership for the ways of knowing, and the evaluation of knowledge sources and certainty (Torres, 2011).

Ownership over the ways of knowing and knowledge claims requires what Baxter Magolda (2009) described as self-authorship. Self-authorship refers to the individual authoring his or her own life by moving from a reliance on external authorities for beliefs, identity, and relations with others to an internalized meaning-making process. This meaning-making capacity provides the basis for dealing with Barnett's supercomplex world. Baxter-Magolda (2004) observed that in response to knowledge uncertainty, as learners develop their beliefs about themselves and about the world, they must internalize the knowledge creation process, combining the objective and the subjective aspects to become authors of their own lives and reality. To achieve self-authorship the individual must reach maturity in epistemological, intrapersonal, and interpersonal developmental capacities.

Baxter Magolda's (2009) work on the cognitive, identity, and relationship meaning-making capacities and maturity necessary for learner success in a complex knowledge world is based on Kegan's (1982) holistic constructivist development framework for meaning-making development. Kegan described the evolution of meaning-making within the constructivist-development framework. Being a person is the activity of composing and organizing meaning, and the ability to organize evolves over time. The activities of organizing meaning and evolution of the meaning-making process over time are at the core of development. From birth, the unseen and unexamined aspects of the world as the individual understands them are considered to be the

subjective aspects; elements of knowing that are not separable from the self. The world is something the person is embedded in and subject to, outside the control of the individual. Through the evolutionary process the individual gradually begins to see things as separate from the self, objects for examination and scrutiny. Object elements are distinct from the self and are such that the individual can exhibit some degree of control over them. At this stage in the evolutionary process the world and the meaning attached to it becomes objective for the learner creating the possibility for reflection on personal worldviews as well as the views of others. This evolution is a balancing by the learner between the subjective and the objective elements that transforms how people construct knowledge as they interpret experiences to create a new sense of themselves in the world (Boes, Baxter Magolda, & Buckley, 2010).

Learning comes from the transformation of meaning-making structures based on an individual's evolving perception of the relationship between what is subject, and what is object (Boes et al., 2010). The evolution culminates at the ability to examine and to reflect on meaning constructs as malleable and as subject to amendment. These cognitive skills of examination and reflection give the individual control over the meaning-making and this cognitive capacity is referred to as the internal authority of self-authorship (Pizzolato, 2010). No longer is the world something outside the individual that he or she is subjected to but rather constructed, and reconstructed by the individual through reflective action.

To develop the meaning-making capacities of self-authorship requires the learner come to understand that knowledge is uncertain, constructed by experts using what they deemed to be relevant evidence in a particular contexts, and therefore subject to revision (Baxter Magolda, 2009). The need to make judgements about the value of alternative pieces of evidence to arrive at a contextually relevant truth assumes an axiology or role for values in inquiry. At cognitive maturity the learner understands the value of multiple perspectives, and is both capable and comfortable entertaining alternate opinions and alternate arguments (Baxter Magolda, 2009). The meta-learner actively seeks out conflicting evidence and conflicting arguments as a means of building personal knowledge.

To cognitively accept knowledge as uncertain and subject to revision requires of the learner intrapersonal capacities for participating in the knowledge construction process. The learner must develop a sense of self as capable of reflecting on, of evaluating, and of making

value judgements on knowledge from multiple sources. An identity as a capable learner provides the basis for individuals to interpret and to act on these learning experiences (Baxter Magolda, 2009). Learner maturity is associated with the development of an integrated identity that includes confidence in one's ability to learn, confidence in one's ability to make knowledge judgments, and confidence in one's ability to act on those judgements (Baxter Magolda, 2009).

These cognitive and intrapersonal capacities provide the foundation for engaging with others to create a synergy in the knowledge construction process (Baxter Magolda, 2009). Mature relationships require the individual respect his own sense of knowing and being as well as the sense of knowing and being held by others (Baxter Magolda, 2009). Without this collaborative process learning is not possible. Although this collaborative process is essential to learning, the meta-learner needs to be capable of effectively considering and evaluating multiple perspectives and sources of knowledge while at the same time still maintaining a sense of independence from the knowing of others such that true ownership of the learning is possible.

Venturing Forward

Barnett (2000) referred to the world of supercomplexity as a world with multiple knowledge frameworks and conceptual overload, essentially a world without knowledge boundaries (p. 415). Supercomplexity is characterized by uncertainty and unpredictability for which students must be prepared by acquiring competencies in knowledge creation and integration processes. The integration process includes constructing new forms of knowledge by reframing, critical thinking, negotiating meaning through employing reflection, and engaging in insightful action. As knowledge proliferates, the complexity and uncertainty of learning and knowing grows. In the course of coming to know, the individual is fashioned, altering the sense of self and being in the world. The adapted self interacts differently, from a new perspective, with the world, influencing the processes for knowing, and altering what can be known in ways that further morphs the self. Through this iterative relationship of influence, what is known and how it can be known, are constantly sculpted by the processes of learning and of being in the world. Ontology and epistemology interact to disturb and impel learning and knowledge for the learner.

Today's focus on knowledge creation requires the 21st century student to be prepared to leverage knowledge through continuous integrative learning throughout his or her career in an

environment where knowledge is complex, uncertain, and has no boundaries. With learning lived as both a journey and a destination, the meta-learner can comfortably envision possibilities beyond the current state of knowing the world.

The argument I make is that only a well developed epistemological understanding at the evaluativist level offers the learner a reason to actively engage in the sustained intellectual inquiry necessary in the knowledge economy. The will to pursue inquiry requires a disposition that understands all encounters with learning offer passage to new possibilities, and meta-learners actively search for those doors within the experience. The meta-learner is mindful of how he or she comes to know within the learning situation and uses this understanding to leverage the experience such that personally meaningful and relevant ways of knowing are possible.

The meta-learner engaged in intentional integrated learning seeks to understand how others come to know as they engage with them in the process, understanding that this form of knowing will enhance their own learning experience and facilitate critical thinking and reflection. This value placed on how others know and the infusion of personal values into the meaning-making process associated with evaluating evidence and arguments suggests a new axiology not considered within existing learning theory. Learning requires competencies and cognitive abilities associated with reflection, engaging in reflection to negotiate meaning of the world, and creating new knowledge through reframing.

Given that intentional learning is dependent on both situational and intrinsic factors (Bereiter & Scardamalia, 1989), the epistemological and ontological assumptions of both the learning situation and the learner are significant to facilitating student development as a meta-learner. There is an anticipated interaction between the learning situation and the learning theories of participants (Bereiter & Scardamalia, 1989). Tagg (2010) argued that if higher education is learning-centered with learning an outcome, how students learn is as important as the content. An awareness of one's ontology and epistemology is important to understanding how learning occurs and what role the context, specifically the academic program, might play in influencing the process and the outcomes of learning. Kuhn (2001) pointed out it is important to go beyond awareness to understanding because it is this that shapes both intellectual values and the cognitive disposition necessary to achieve the cognitive competencies and the cognitive skills

essential for critical thinking, and for intentional learning. A disposition that allows the learner to objectively evaluate arguments independent of prior beliefs is the foundation for critical thinking and as such a prerequisite for open-minded thinking (Stanovich & West, 1997).

Mason (2003) described intentionality as being characterized by internally initiating and controlling actions with learning as a goal. Implicit to intentional learning is that the student is able to conceptualize a potential knowledge state and level of understanding beyond the current one. Mason stated that personal beliefs about the nature and the acquisition of knowledge are important to the learning process as these beliefs can guide or constrain the learning goals.

Baxter Magolda (2009) suggested to operate in Barnett's supercomplex world requires the learner to acquire specific meaning-making capacities. How knowledge is constructed mediates what is learned, and the meaning-making that results from the learning experience (Baxter Magolda, Abes & Torres, 2009). The desired cognitive abilities and beliefs associated with students being meta-learners become relevant.

The meaning-making capacities associated with ways of knowing, with identity construction, and with interpersonal relationships, are desired transformational learning outcomes in higher education and they arise through personal development and maturity (Baxter-Magolda, 2009). Research has found the capacity for reflective judgements is a developmental process that emerges over time, and is influenced by education (King & Kitchener, 1994). Personal beliefs about knowledge and knowing have been viewed as an important element of learning (Hofer, 2001). Education is thought to influence these beliefs by facilitating skill development related to both critical evaluation and reconciliation of theory and evidence (King & Kitchener, 1994). There is a need to look at the opportunities within academia for promoting development of higher levels of reflective judgement in students given the influence that epistemic thinking has on the ability to make decisions about complex issues (Hofer, 2001). While personal epistemology has been identified as important to learning and to problem solving, it has not been widely incorporated into teaching and learning within the education system (Hofer, 2001; 2004; Kuhn, 2009). The cognitive development necessary for self-authorship is often not achieved in the first four years of higher education (Torres 2011).

Much of the debate regarding the role of higher education in the age of supercomplexity has focused on capacities and competencies related to cognitive skills such as critical thinking.

Kuhn (2001) offered insight into an aspect of cognitive development, referred to as thinking disposition, which is virtually ignored in the discussion of cognitive skills. Kuhn differentiated between meta-level competence and dispositional factors, advocating that both elements are necessary for intellectual development and for intellectual performance. Epistemic understanding of how a person knows is the basis for developing the intellectual values and the disposition necessary for inquiry when knowledge is assumed to be changing, complex, and uncertain.

Kuhn (2001) proposed the knowing strategies employed by a learner in knowledge acquisition include inquiry, analysis, interpretation, and developing an argument to justify claims. These knowing strategies are thought to be dependent on holding intellectual values that support these processes. These values are based on personal epistemological beliefs about knowledge and knowing. Only when the learner holds values that inquiry and analysis are worthwhile and that pursuing inferences and arguments is important, will the individual have the necessary disposition to engage in knowing strategies. Valuing inquiry is a prerequisite to the application of the cognitive skills and the competencies necessary for coming to know something.

Regardless of the competencies and skills of the learner, only when the individual possesses a cognitive disposition that includes a belief structure and an attitude that is open to considering and evaluating alternative perspectives, is it possible for the learner to engage in knowing strategies. It is these beliefs and the valuing of the knowing strategies that inform and guide the learning process and therefore axiology is important and closely linked to the ontology and epistemology of the learner. Existing perspectives and beliefs are modified based on the inquiry and analysis. Baxter Magolda's (2009) stated that developing the intrapersonal capacities or disposition necessary for self-authorship was a prerequisite for cognitive maturity. Kuhn (2001) argued that disposition might have a greater influence on intellectual performance than does competence. This disposition is instrumental to the ownership of knowledge required by the meta-learner, who must be able to not only make judgements about knowledge, but act upon them.

There is evidence that human reasoning is biased by prior beliefs (Stanovich & West, 1997) and that differences in these beliefs will influence a learner's intellectual skills and ability

to acquire new knowledge (Kuhn, 2001). So while much of the discourse has been around how academia develops cognitive abilities this analysis will expand the discussion to consider how academia might influence and shape the beliefs, values, and disposition of the learner.

I have so far identified the need to examine learning and the outcomes of higher education in the current knowledge environment, and I have proposed an imperative for the development of students as meta-learners. I have provided insight into the cognitive development anticipated to be necessary for the meta-learner, based on my assumption that knowledge is complex, uncertain, and changing. In the next chapter, I describe three perspectives on knowledge that provide the foundation for my exploration in Chapter 4 of the contribution that learning theories can make to delineating learning when student development as learners is the desired outcome of higher education. As the basis for considering how existing learning theory contributes to facilitating students becoming meta-learners, I explore the ability of these learning theories to further epistemic understanding, to develop and shape both intellectual values and disposition, as well as to enable meta-cognition. Assuming both the learning situation and intrinsic factors contribute to development as a meta-learner, perspectives, represented by the approaches to learning employed in academic programs and those approaches employed by individual learners, will be relevant (Bereiter & Scardamalia, 1989). Several questions need to be asked in this regard: What do the different theories contribute to understanding and facilitating students' progress toward becoming meta-learners? How is personal epistemology accommodated within the models? What assumptions does learning theory make about epistemological beliefs and about epistemic cognition? What interventions and mechanisms for epistemic change and the development of a thinking disposition are anticipated?

CHAPTER 3

PERSPECTIVES ON KNOWLEDGE AND LEARNING AS A BASIS OF ANALYSIS

> It would be impossible to over-estimate the educational importance of arriving at conceptions: that is, meanings that are general because applicable in a great variety of different instances in spite of their difference...They are known points of reference by which we get our bearings when we are plunged into the strange and unknown... Without this conceptualizing, nothing is gained that can be carried over to the better understanding of new experiences. (Dewey, 1933 p. 153)

The worldviews of instructors determine choices related to knowledge dissemination, while students' beliefs influence the knowledge transfer and evaluation process, and the interaction between these two perspectives shape the outcomes of the learning activity. Studies in higher education indicate that teachers' conceptions of learning are reflected in their conceptions and approaches to teaching, which directly influence both the student's approach to learning and the learning outcomes (Trigwell, Prosser, & Waterhouse, 1999). To improve the outcomes of learning requires a focus not on the modes of learning but on conceptions of learning (Trigwell & Prosser, 1996). Barnett (2011) stated that in the current environment there is no consensus on the appropriate framework for comprehending and relating to the world.

I have argued for the development of the meta-learner as an outcome of higher education and for the importance of cognitive development of both the skills and disposition that support reflective judgement and engagement in inquiry into knowing. In Chapter 3 I elaborate on the three views of knowledge outlined by Bredo (2006) to offer an overview of diverse perspectives on learning that may be employed in teaching and learning. The purpose of the chapter is to describe learning within the context of three perspectives on knowledge as a frame for analyzing the development of the student as a meta-learner in Chapter 4. I have selected the structure offered by Bredo for understanding the distinct views of knowledge creation as a framework for organizing the diverse theories and models of learning based on what knowledge is and how it is created. I contend that understanding the ontological and epistemological assumptions associated with the various theories and frameworks for learning provide insight into the personal belief systems guiding the process and meaning of learning.

Multiple Perspectives

Lincoln and Guba (1985) stated that it is not possible for inquiry to be neutral. Perspective, a view with a particular focus that results in seeing only a partial picture of the whole, is important and inescapable. Perspective changes the concept of reality from a single truth to one of multiple kinds of knowledge that can be explored through multiple methods. As Guba (1990) pointed out, the choice of a perspective or paradigm brings with it ontological and epistemological values that will influence both the inquiry process and outcomes. The implications of the paradigm choice in terms of the values and perspective it imposes on the inquiry must be considered.

Guba (1990) stated that paradigms implicitly must reflect the values of those who created them. When an inquiry is undertaken the participants make choices related to the problem to study, the paradigm within which to study, the methodology and methods of analysis to use, and the interpretation of the findings. All of these choices made in the inquiry process have values attached to them that will influence what the inquirer sees and ultimately the partial picture the inquiry reveals. Guba argued that as a result nature is not seen as it really is or how it really works, but rather through a specific value window. This assertion of a specific value window suggests all inquiry is subjective in nature when it represents only one perspective or way of viewing a particular phenomenon. The *whole* is created only through combining multiple perspectives.

Guba (1990) raised the question that if it is assumed values enter into every inquiry; the issue becomes what values and whose values will govern. The discussion of perspective is broadened to include the influences of the personal values and belief systems of all those involved in teaching and learning in higher education. If the outcomes of learning will change depending on the values chosen or perspective taken, it becomes part of the responsibility of academia to reflect on how the conceptions of learning operating in higher education influence the learning process and outcomes. How do the conceptions of learning employed within academic programs fit with the values established by the institution and allow for the values and belief systems of participants? Can a learning experience only offer one perspective, and if so, what should that perspective be in an environment of knowledge uncertainty and self-doubt?

The mental processes and the instruments of inquiry are not neutral, but rather influence and shape perspective (Lincoln & Guba, 1985). The mental processes and inquiry have an iterative relationship where the participant's perspective influences the inquiry and learning, and at the same time the process of inquiry and learning sculpts the perspectives of learners. This has implications for the process and outcomes of learning and will be explored later within each of the theories evaluated.

Knowing and Learning

Bredo (2006) used Godfrey-Smith's three views of knowledge (internal, external, and dialectical) as the basis for understanding the historical development of ontological and epistemological beliefs. Although a variety of models and theories exist within each view, the three views have distinguishing epistemological and ontological assumptions that have implications for understanding human cognition and learning. I utilize the external, internal, and dialectic views of knowledge to provide a framework for discussing learning theories potentially influencing inquiry and education.

The External View

In the external view, Godfrey-Smith asserted that knowledge is based on objective events and experiences (Bredo, 2006). External objects are the basis for sensory experiences that provide basic ideas to the mind where they are combined to create more abstract and complex knowledge about the external world (Bredo, 2006). The relationship between the individual and the world is objective with one truth or reality existing external to the consciousness of the knower. Within this understanding of knowledge are individual learning models including the behaviourist, cognitive, and humanist viewpoints. This view of coming to know is consistent with the paradigm of postpositivism described by Lincoln and Guba (1985).

Postpositivist Approach

Guba (1990) stated that the positivist belief system holds the view that one reality driven by natural laws exist, external to the individual, and that it is possible for the inquirer to objectively know that reality through experimental manipulation. Postpositivism is a modified form of positivism that supports the ontology of critical realism where one reality exists, but that it is not possible for an individual to know it perfectly because of human biases and intellectual limitations that influence the inquiry and truth revealed through it. Positivism has inquiry as

value-free but postpositivism acknowledges that values do enter into inquiry but can be controlled (Teddlie & Tashakkori, 2009). To counter human subjectivity, modified experimental methods are utilized that emphasize multiple sources of data to support the interpretation of findings and relevance to the intended real world application.

Individual learning theory

Individual learning theories advocate that information and knowledge processing is an inner mental function with the mind as the center of learning (Brandi & Elkjaer, 2011). The individual is the basic unit of knowing and learning, and knowledge resides in the individual mind (Paavola & Hakkarainen, 2005). Consistent with positivism and the external view, reality is assumed to be a set of static facts that exists external to the individual and that can be learned through acquiring new mental models (Khalifah & Rallis, 2010). Learning occurs through processing of symbols, focusing on propositional knowledge, and structuring conceptual knowledge (Paavola & Hakkarainen, 2005).

According to individual learning theories, pre-existing structures of knowledge are acquired through learning. Knowledge is transmitted from the provider to the consumer. Mental models of the mind represent the learning and information processing capacity of the learner, which are modified and enhanced when the cognitive structures are altered within the mind (Brandi & Elkjaer, 2011). Learning is an individual, conscious process, separable from social interactions and processes, and aided by logical knowledge structures and generalizable knowledge (Paavola & Hakkarainen, 2005). The purpose of learning is to acquire a pre-existing body of facts and concepts (Brandi & Elkjaer, 2011). Although knowledge is externally determined, the individual controls the learning process based on personal capacity and willingness to take in the information provided by the environment.

Consistent with these conceptions of learning, the individual is considered separate from the context for learning and the emphasis is on the epistemological issue of how the individual learner comes to know, not on the development of the learner (the ontological aspect of learning) through participation in the social process (Brandi & Elkjaer, 2011). The role of social interactions in the learning, socialization, and development of the individual is limited. The manipulation and shaping of individual mental models is the essence of learning. Mental models of what to do in uncertain situations are developed and drawn upon when needed within the

specific social context. Individual learning theory assumes that the mental models exist before action is taken.

Knowledge is understood to exist in a real sense outside the individual in some form, and learning is the acquisition of that information passed from knower or teacher to learner or student (Brandi & Elkjaer, 2011). Learning is a conscious activity intentionally undertaken when the learner determines there is a need to gather facts or understanding to address an identified knowledge deficiency. The knowledge acquired by the individual is used to act within a certain social situation. The individual learner and the social context in which the individual is acting are distinct in terms of the learning process. In individual learning theory there is a split between epistemology, to come to know about the world, and ontology, being or becoming part of the world, thus divorcing learning from human development and thinking from acting (Brandi & Elkjaer, 2011, p. 42).

Approaches to individual learning theory. The three main orientations in individual learning theory are behaviourist, cognitive, and humanist (Bandura, 1986; Jakubik, 2008; Maslow, 1968; Rogers, 1985; Skinner, 1985). These theories assume knowledge to be free of social or contextual influence (Rømer, 2002). They focus on the autonomy of the learner (Amstutz, 1999) by promoting learning as an individual activity and competency. Traditional learning theory divides learning into distinct thought processes and structures that can operate in different contexts; and only some of these learning contexts are social (Greeno, 1997). Learning activities are composed of individual knowledge or stimulus-response relationships that are affected by context. Both individual knowledge and the context in which it develops influence the learning process (Greeno, 1997).

Behaviourist theory emphasizes learning for the purpose of acquiring standardized competencies (Amstutz, 1999) and behavioural changes. The individual responds to stimuli demonstrating learning has occurred by an observable quantifiable change in behaviour (Skinner, 1985). For example a child burned when touching a stove will not touch it again. Behaviourists assume learning is the acquisition of skills for the purpose of applying these skills to new situations (Greeno et al., 1998).

Cognitive learning theory focuses on thought processes to explain learning (Greeno et al., 1998), examining the mental structures constructed to give meaning to information (Amstutz,

1999). Learning is the growth of conceptual understanding and strategies for thinking and understanding (Greeno et al., 1998). Cognitive learning looks at the cognitive processes that result in the person gaining some idea of what might happen from acting in a certain way. The person first thinks, and chooses to act in a certain way (Skinner, 1985).

Human motivation and action can be explained by the combined influence of cognitive, behavioural, and environmental factors (Bandura, 1986). From observation, the learner retains symbols and creates cognitive representations in the mind that are compared with past personal behaviour and applied in different situations (Smith, 2009). Cognitive processes and conceptual structures acquired by the learner as parts of the learning process are essential to understanding the world and are used for future learning (Salomon & Perkins, 1998). The direction of action is from organism to environment while for behaviourists it is from environment to organism (Skinner, 1985).

Humanist learning theory emphasizes individual development with the objective of going beyond behavioural changes suggested by cognitive and behaviourist theories to changes in values, attitudes, and beliefs (Amstutz, 1999). Humanists assume that the learner is self-directed and internally motivated, and the goal of learning is self-actualization (Amstutz, 1999; Maslow. 1968). Humanists stress personal growth as well as meeting personal needs and goals.

The Internal View

In contrast to the external view where knowledge and reality exists external and independent of the individual, the internal view is based on the assumption that perceptions of objects are shaped by an individual's prior conceptions and that ultimately objectivity comes from within the mind where all external sensory stimulants are interpreted (Bredo, 2006). Sensory stimulation and objects can only be known through the prior assumptions and conceptions of the mind, and therefore people construct knowledge through implicit beliefs of the mind (Bredo, 2006). As a result, knowledge is subjective. While the external view postulates that the mind is the consumer of an external body of knowledge, the internal view is based on the assumption that the mind as the producer of knowledge, determining what constitutes as knowledge and what can be known. Construction of reality occurs within the mind and as a result there is no separation between the knower and the constructed cognitive world. This belief

system is supported by constructivism and has given rise to social constructivist learning theory and situational learning.

Constructivist Approach

Guba and Lincoln (2003) described the ontology of constructivism as relativism. For constructivism, reality is subjective, taking the form of multiple mental constructions that are socially and experientially based, being both local and specific to the context in which they occur (Guba, 1990). The form and content of reality is dependent on the individual that holds the mental construct. Reality is not an objective knowable truth but a shared construction and therefore specific to the context in which it occurs. Individuals do not discover knowledge but construct their own meaning of the world through individual experiences (Schwandt, 2003). Knowledge and truth for a person are the result of social interactions and experiences, and based on an individual's perspective. Through interaction with others the individual constructs meaning and interpret personal experiences. Multiple realities exist, and understanding is co-created between the participants and requires naturalistic procedures of inquiry (Denzin & Lincoln, 2003). The aim of constructivism is not to predict, control, or transform the *real* world, but to reconstruct the world where it exists in the mind (Guba, 1990). Inquiry is bounded by values (Teddlie & Tashakkori, 2009)

Constructivists believe that the purpose of an inquiry is to understand how participants make meaning out of and interpret their worlds (Merriam, 2002). Guba (1990) argued that reality exists only in the constructs of the mind; the aim therefore is not to transform the world but transform the mind. Inquiry or learning is shaped by the interactions among the participants. Reality can only be seen through a particular value window that is co-constructed within the social process; and therefore many constructions are possible. According to the constructivist paradigm, the goal of inquiry is to describe, understand, and interpret how individuals experience and interact with their social worlds (Merriam, 2002).

Social constructivist learning theory

Social learning theory suggests that learning is an integral part of human activity and therefore cannot be avoided (Easterby-Smith & Lyles, 2005). Learning is defined as socially constructed relational activities, participation patterns, and interactions, not as an individual thought process (Easterby-Smith & Lyles, 2005). Consistent with the internal view of

knowledge and constructivism, social learning centers around knowledge creation amongst people as an iterative process, rather than around knowledge transfer between people in a linear unidirectional manner. Individuals giving meaning to their world by interpreting their experiences. Learning is considered to occur as a result of participation in social processes that encompass both the epistemology of knowing and the ontology of being or becoming (Brandi & Elkjaer, 2011)

The content of learning is becoming a participant and forming an identity. Learning exists as the sense of self that is created through the process of participating and therefore does have an objective, ontological component (Brandi & Elkjaer, 2011). Enculturation in the form of successful participation is the goal of learning. In participating, individuals form part of the specific situation, and they contribute to producing the patterns of participation and interaction (Elkjaer, 2005). The purpose of learning is to acquire the skills to communicate and act according to the social norms of the group. Learning has occurred when the individual is able to successfully participate in the particular social situation.

According to social constructivist learning theory, knowledge flows through action and is embedded in doing and therefore is not an object that can be stored (Fenwick, 2000). The context that gives meaning to the knowledge, with learning coming not "out of" but "through" the experience. Both learning and human development within social transactions are transient and evolving in nature and perceived to be "powerless artifacts of social discourse" (Stentsenko & Arievitch, 2004, p. 478), and therefore irrelevant and impossible to study outside of the social interaction in which they are manifested.

A particular social situation offers certain possibilities for some actions and not for others, depending on the individual's experience and the context (Brandi & Elkjaer, 2011). Individuals are at the same moment the products of their social and cultural history, and they are producers of situations that reflect those socially and culturally embedded experiences (Brandi & Elkjaer, 2011). Here, generalizable rules and conceptual knowledge are not important, but instead situated knowledge and cognition are stressed (Paavola & Hakkarainen, 2005).

An individual's acquired skills or competences, such as the ability to communicate with others within a group, are not considered knowledge but simply the tools for successful participation in social practices. Successful contextual participation is referred to as knowledge

(Greeno et al., 1998). Social interactions are a mechanism for joint construction of knowledge that is shared and distributed over the entire social system, as opposed to being possessed by individual group members (Salomon & Perkins, 1998). The term "knowing", which implies an action rather than an object, is deemed more appropriate than the term knowledge to describe the regular patterns of participation in social interactions as well as the material and culture of the social context (Greeno, 1997). Knowing can be generalized to other situations not transferred to another individual as an object independent of the context (Greeno, 1997).

Those holding a social constructivist perspective of learning advocate that learning and student identity or sense of self are both social constructions existing only in the ongoing social transactions between people. Knowledge exists within these interactions, and knowledge construction is a collective activity. Individuals construct meaning from the social interactions and relationships that occur within specific social-cultural situations (Brandi & Elkjaer, 2011). Learning is participation in the social process of knowledge construction. The focus is on the process of participation not on the outcomes or products; it is about coming to know or knowing (Brandi & Elkjaer, 2011). Knowledge is an aspect of participation that is embedded in the participants and their environment and does not exist outside the contextual constraints of that participation (Paavola & Hakkarainen, 2005).

The self only has meaning within the particular social context within which it is created and played out. From this perspective, context is socially constructed within the interaction and so has no social and cultural history. Intervening to change the context for learning and development becomes difficult to undertake, when it does not exist before or after an activity, but only within it (Brandi & Elkjaer, 2011).

Social learning theory emphasizes the social nature of learning. Learning is the process of actively participating in the world. Knowledge is the interaction between people. Individuals interact with others and the world based on their history, experience, and personal context. Bringing personal history and culture to the experience influences the learning that occurs in that interaction. Individuals are both the product and producers of social learning situations (Brandi & Elkjaer, 2011). Learning does not rely on cognitive processes of the mind, but rather learning occurs as a result of social interactions with other individuals, with artefacts, and with the contexts that are themselves the products of social interactions. These multiple interactions

creating a complex compilation of social learning that combines to create a unique and dynamic learning experience.

Situational learning theory. In contrast to the three traditional cognitive approaches to learning associated with the external view, situational learning emphasizes the context or situation in which learning occurs (Rømer, 2002). Learning occurs in a social situation of co-participation, and learning is not thought to be the acquisition of certain knowledge, but rather to be represented in the relationship between people (Smith, 2009). Situational learning occurs in participation in the practices of inquiry and of discourse that lead to the construction of the meanings of concepts and the uses of skills (Greeno et al., 1998). Situated learning challenges the notion that what is learned can be separated from how it is learned and used (Brown, Collins, & Duguid, 1989).

Situational learning does not distinguish between the social and individual aspects of knowledge and learning. All activities are both social and individual, and learning occurs as part of participation in social practice. Greeno (1997) offered the example of how a student studying a textbook alone may not be interacting with other people, but is still influenced by the social context in which the book was developed, and the social setting in which the learning will eventually be applied.

According to situational theory, learning is constantly occurring through the activities of individuals. As these activities are occurring, both knowledge and the actual environment in which the activity occurs are altered for all participants through the experience. Knowledge created through the process becomes embedded in the individual's mind, and it influences how the person's environment is interpreted or understood as a result of the activity (Nidumolu, Subramani, & Aldrich, 2001). The focus of learning moves from the individual acquiring objective knowledge to the patterns of interactions in the activity system, with knowledge seen as being rooted in the connection between individuals, and in the norms and culture that govern the patterns of behaviour and interactions of the individuals (Nidumolu, et al., 2001).

The situational theory of learning is supported by complexity theory, which suggests that within organizations learning is shaped by the complex, multi-dimensional nature of the interactions between group members (Yuan & Mckelvey, 2004). An integral part of what is learned is the activity in which knowledge is developed and utilized (Brown et al., 1989).

Stacey (2000) referred to learning as the complex responsive process of relating to others. Knowledge is continuously reproduced and transformed in the process of interactions between people. Knowledge is not stored but can be represented in the form of artefacts or tools when these instruments are used to facilitate interactions between people. Knowledge does not exist in any other tangible form. As a result, people cannot share knowledge but rather create it through the process of relating to others.

Learners are at any moment both the outcome of their social and cultural history and the creators of activities and context that represent that history; and are therefore both the product and the producer of situations (Elkjaer, 2005, p. 43). Culture does not exist separate from people in interaction. People hold culture in their heads. It is only possible to observe the symbols of culture (e.g. objects, acts, language, or concepts) that stand ambiguously for a spectrum of meanings, evoke feelings and emotions, and motivate people to action (Smircich, 1985)

Symbols and actions are socially constructed, given meaning only when another individual responds to an action. Knowledge is represented in the pattern of relationships between group members, and it is lost when those relational patterns no longer exist (Stacey, 2000).

> If, when one makes a gesture to another, one is able to experience in one's own body a similar response to that which the gesture provokes in another body, then one can "know" what one is doing. It becomes possible to intuit something about the range of likely responses from the other. This ability to experience in the body something similar to that which another body experiences in response to a gesture becomes the basis of knowing and of consciousness. (Stacey, 2000, p. 31)

Wenger, McDermott, & Snyder (2002) suggested tacit knowledge is the innate understanding of complex and interrelated issues developed as part of expertise that makes it possible to undertake dynamic context-specific problem solving. Tacit knowledge is sometimes the most coveted and is most effectively shared through interactions and informal learning processes. This knowledge often underlies the application of explicit knowledge. It cannot be articulated; it is what we know but cannot express (Baumard, 1999). Tacit knowledge resides in the skills, understanding, processes, and relationships of groups. This knowledge is often difficult to articulate and is not transferred between individuals through formal instructions, but it

is rather an integral part of the process or act of doing something that is understood by others within the particular social situation and embodied in the experience.

The Dialectical View

The dialectical view, the third view outlined by Bredo (2006), assumes a more active role of the knower in acquiring knowledge. What is known influences action and that action influences what can be known. It is an iterative process, through which the environment influences the individual, and the individual influences the environment or context. Knowledge creation is the interaction between the external world and the interpretation of that world by the person (Khalifah & Rallis, 2010). Bredo stated that the dialectical view combines the external and internal views as part of an ongoing process of coming to know. Concepts, beliefs, and norms are tools for interacting with the world, and they are reshaped through the knowledge creation process. The truth sought in an inquiry is that which proves useful in taking action, and its future usefulness is evaluated based on past experience. This view supports a pragmatic worldview described in the participatory paradigm (Lincoln & Guba, 1985), encompassing the activity theory and social cultural models of learning including co-operative inquiry and cultural historical activity theory.

Participatory Approach

In 1997, Heron and Reason proposed the addition of the participatory paradigm to the four major paradigms outlined by Lincoln and Guba (1985). The participatory paradigm draws from both the positivist and constructivist perspectives stressing that the experiential encounter with the presence of the world is the basis for human being and knowing. These authors advocated that to experience anything requires participation, and that by participating in the world the reality experienced by an individual is co-created through that interaction with the world. Reality is always subjective-objective, because ultimately things have to exist to be experienced. A primal reality exists in the cosmos making it objective (Heron & Reason, 1997).

Individuals can only experience something if it is there. To participate, the learner requires the presence of what is participated in. The limitation to the objectivity of reality is that as soon as an individual makes any attempt to articulate or describe the given object the account of the object is influenced by culture and context. Therefore an individual's interpretation of what is there is subjective. As a result of the subjective nature of knowing, the participatory

paradigm advocates there is no final or absolute account of what exists but instead multiple realities. The values of the individual are important in arriving at this interpretation of the world (Teddlie &Tashakkori, 2009).

> While positivism sees a world of separate objects independent of human construing, and the relativist worldviews see nothing but constructions of the human mind and culture, in the participative worldview there is a given cosmos, a primordial reality, in which human intelligence—body, mind and spirit—actively participates. Human intelligence and the given cosmos are engaged in a co-creative dance, so that what emerges as reality is the fruit of an interaction of the given cosmos and the way mind engages with it. We actively participate in the cosmos, and it is through this active participation that we meet what is other. (Reason, 1998, p. 425)

The participatory reality assumes reality presents only once it has been shaped by the mind; and therefore reality is subjective. Reality is known only within the context in which it is created and this "knowing" is influenced by the subjectivity of others (Heron & Reason, 1997). As a result, knowing is socially constructed, and only possible through interaction and dialogue with others, forming the shared culture and language that shapes the knower and what can be known. The dialectical process of reciprocal influence between the knower and the context or situation provides a tacit experiential knowing among participants and forms the basis for explicit ways of knowing (Heron & Reason, 1997).

Four ways of knowing. According to the participative paradigm individuals must utilize diverse forms of knowing to experience the world (Reason & Bradbury, 2001). Knowing is not something to be discovered or created, but rather it arises from the experience of living. Heron and Reason (1997) proposed that there are four ways of knowing: experiential, presentational, propositional, and practical. These four ways of participating in the knowing co-create the individual's way of knowing.

Experiential knowing is the foundation for all other ways of knowing and refers to knowing by acquaintance, meeting, participating, and other direct encounters with the world (Heron & Reason, 1997). These interactions are internalized and shape the individual's subjective world (Chandler & Fry, 2009). Experiential knowing is tacit knowing that is difficult

to put into words, because it comes intuitively from the experience of participating and interacting with others (Heron & Reason, 2004).

Presentational knowing is the first form of expressing experiential knowledge represented through story, drawing, sculpture, movement, dance, and other representations of experiential knowing (Heron & Reason, 2004). It is an expression of the meaning the world has for people. From experiential and presentational knowing concepts and theories about these ways of knowing are developed and form the basis of *propositional knowing* (Heron &Reason, 1997).

Practical knowing is the set of skills and competencies of how to do something (Heron & Reason, 2004). Practical knowing allows all other forms of knowing to be applied within one current context (Heron & Reason, 1997). Heron and Reason (2004) believed that knowing is richer and deeper when all ways of knowing are aligned. Knowing must be grounded in experience, represented through stories and images, understood through theories and concepts, and expressed through action in the world.

> From all this it follows that what can be known about the given cosmos is that it is always known as a subjectively articulated world, whose objectivity is relative to how it is shaped by the knower. But this is not all; its objectivity is also relative to how it is intersubjectively shaped. Knowers can only be knowers when known by other knowers. Knowing presupposes mutual participative awareness. It presupposes participation, through meeting and dialogue, in a culture of shared art and shared language, shared values, norms, and beliefs. (Heron & Reason, 1997, p.280)

Heron and Reason (1997) referred to an individual's awareness and understanding of the ways of knowing and the influence the ways of knowing have on knowledge creation and perceptions as critical subjectivity. Individuals have significant discretion in terms of how the ways of knowing are utilized and how they interact with each other. Critical subjectivity provides the opportunity to change the relations between the ways of knowing such that a clearer and more disciplined subjective reality is revealed. Given that all ways of knowing are influenced by the experiential context, understanding them requires a critical subjectivity involving dialogue with and feedback from others. Heron and Reason referred to the exploration of shared experiences and meaning with others as critical intersubjectivity.

Activity learning theory

Activity theory, similar to situational learning emphasizes the social aspect of learning focusing on dialogue, interaction, negotiation, and collaboration (Bonk & Cunningham, 1998), but it offers a different perspective on the role of context in learning. Brandi and Elkjaer (2011) advocated that activity theory was distinct from social constructivism in that context is a historical and social product that has a significant influence on learning. The context is co-produced by the social processes in which individuals participate and it is culturally and historically formed. According to activity theory, the social structures and embedded power relationships that exist in a specific context define in part what can be learned. The potential learning capacity of a particular situation is determined by the individual learner's capabilities combined with the quality of the interactive context (Bonk & Cunningham, 1998). When the learning is internalized, the individual can build on these learning experiences for further development (Bonk & Cunningham, 1998).

Elkjaer (2005) suggested that as soon as the locus of learning moves outside the individual mind to social relations, it moves into the arena of power and conflict. The presence of power and conflict in social relationships makes the issue of empowerment central, given that to participate in learning the individual requires access and opportunity. The social structure of the activity, the power relations present in the situation, and the social constraints that determine what constitutes appropriate action, define the possibilities for learning. As a result, understanding learning requires examining the context and setting in which it occurs (Bonk & Cunningham, 1998)

Approaches to social cultural learning. The conception that the locus of learning is activity has been operationalized in models for undertaking and understanding the process of learning and inquiry. These models of learning acknowledge the influence of social context and culture on how the world can be known, and the contextual and cultural influences empower individuals within the learning process. The assumption of cultural and historical influences on learning provides the frameworks for shaping the learning and inquiry that transforms and defines participants and their world.

Co-operative inquiry associated with the participatory paradigm emphasizes the importance of shared experiential context and meaning that shapes culture in determining an

individual's subjective reality. Knowing of the world comes from participation in the world and therefore participatory research is transformative, providing an opportunity to change the world (Heron & Reason, 1997). Individuals participate in the world for the purpose of co-constructing reality, which implies that they act upon the world.

The idea of a shared experiential meaning requires a methodology of co-operative, collaborative inquiry involving both critical subjectivity and intersubjectivity (Heron & Reason, 1997). Co-operative inquiry is action oriented, involves all four ways of knowing, and is based on people exploring their own experiences and actions in collaboration with others who have similar concerns and interests (Heron & Reason, 2004).

> Co-operative inquiry is a way of working with other people who have similar concerns and interests to yourself, in order to understand your world, make sense of your life and develop new and creative ways of looking at things learn how to act to change things you may want to change and find out how to do things better. (Heron & Reason, 2004, p. 1)

Heron and Reason (2004) stated a co-operative inquiry group engages in alternating cycles of reflection and action. People collaborate to develop a research question and methodology, which involves propositional knowing. The methodology is subsequently applied in a particular practice in the world. Co-operative inquiry requires practical knowing and leads to new forms of experiencing the world or experiential knowing. Presentational knowing allows these new forms of understanding to be represented and shared in a meaningful way. According to Heron and Reason this process leads to revisions to propositional knowing related to the original research question. It allows participants to become more aware of their world and reflect on their experiences in ways that provide a richer understanding of the meaning of those experiences.

Cultural-Historical Activity Theory (CHAT) offers an alternative social learning model grounded in American pragmatism. It advocates that context is a product of social and cultural history and a significant influence on the learning experience (Brandi & Elkjaer, 2011). It is a theoretical framework used to identify and describe learning situations called activities. Learning is only understood within the specific situation in which it occurs, and it is highly dependent on the social, historical, political, and cultural context. Therefore activities are defined as the meaningful context for studying and evaluating individual learning.

All elements of the activity interact to influence, transform, and guide all aspects of the learning experience. Individual roles and the interactions between and among them shape and define the learning experience and can be analyzed to help understand the dimensions of learning as an activity. Individual learning experiences can only be understood by interpreting the influence of both the cultural histories of each participant and the artefacts in shaping the learning activity. The outcomes of an activity influence the activity, its participants, and other activity systems emphasizing the cultural historical context in which the learning experience is embedded and interacting with. Analysis requires revealing the relationships between the elements of the activity that are continually being transformed. As a result, a holistic perspective of the learning activity is required.

CHAT takes a sociocultural view of identity construction, incorporating both individual and social aspects of identity in a non-dichotomizing way (Stentsenko & Arievitch, 2004, p. 476). The theory offers conceptual and methodological tools for exploring how sociocultural processes shape identity construction (Penuel & Wertsch, 1995). Personality is deemed to be a way of being in a system of social relations or activities, and culture provides the conditions for personality formation such that it can be studied through observing and understanding individual activity (Leont'ev, 1978).

Venturing Forward

The three views of knowledge I have discussed in this chapter are supported by different approaches to inquiry with specific ontological, epistemological, and methodological underpinnings. The approaches and theories of learning described under each view reflect certain beliefs about realty, what can be known, and how it can be known. It follows that the individual as a learner is defined and developed in different ways within each model. Furthermore, each model will offer a distinct framework for delivering educational programs by privileging certain knowledge and learning styles.

As knowledge grows, the tools, artifacts, symbols, and materials that support learning are altered and expanded, and the resources available to mediate learning are transformed (Bonk & Cunningham, 1998). The proliferation of knowledge changes not just what can be learned but what constitutes learning and the learning process. It creates an ongoing volatility in the

learner's belief system of sufficient magnitude that it warrants revisiting the relationship between ontology, epistemology, and methodology.

Khalifah and Rallis (2010) touched on the tentative and changing nature of knowledge by speculating that the relationship between ontology, epistemology, and methodology should not be defined as linear and static but rather as cyclical and recursive. They argued that it is plausible that some form of knowledge might be necessary before reality can be defined and meaning attached to it; and likewise, what can be known may determine the means by which knowledge can be obtained and interpreted before reality is defined. "In this circuit, the real, knowledge about it, and approaches to acquire this knowledge, are trapped in an ongoing iterative dialectical process where the three interacting concepts legitimate, drive, and constrain one another" (p. 107).

In Chapter 1 I explored the tumultuous and volatile relationships between ontology, epistemology, and methodology anticipated to continually reshape the belief systems of participants. The tentative nature of reality and knowing can contribute to uncertainty and self-doubt for learners, and ultimately adds to the complexity of the interaction between individuals in a learning experience. This learning environment led to my proposition that the development of students as meta-learners should be an academic outcome in higher education. I considered the epistemic beliefs and cognitive development necessary for the meta-learner in Chapter 2. In Chapter 3, I provided an overview of three distinct conceptions of knowledge and the learning theories associated with them. If paradigms are no longer assumed to be static but transient and unstable, both the process of learning and the construction of self will be altered. This transformation of the self must be a consideration in learning theory. Based on this understanding, I explore in Chapter 4 the implications of each of three learning theories for the development of students as meta-learners.

CHAPTER 4

APPLICATION OF LEARNING THEORIES TO THE META-LEARNER

> A man of sound judgment in any set of affairs is an educated man as respects those affairs, whatever his schooling or academic standing. And if our schools turn out their pupils in that attitude of mind which is conducive to good judgment in any department of affairs in which the pupils are placed, they have done more than if they sent out their pupils possessed merely of vast stores of information or high degrees of skill in specialized branches. (Dewey, 1933, p. 120)

It is through an exploration of the epistemological belief systems that it becomes possible to understand the perspectives of what and how learning occurs (Schommer-Aikins, 2004). In the preceding chapters I discussed the need for the meta-learner and for cognitive development associated with metacognition. I have outlined in the previous chapter three views of knowledge including the affiliated paradigms and beliefs. I present here one learning theory from each of the three broad views of knowledge discussed in Chapter 3 to delineate learning within the respective belief systems. As the basis for the discussion and the analysis I undertake in this chapter, I provide the academic rationale and the supporting evidence within the literature for personal epistemology and conceptions of knowledge and learning in Chapter 2 and 3, and these sources are not cited again here.

The belief systems associated with each distinct view of learning have implication for the conceptions and approaches to learning employed within higher education. The main focus of this chapter is my analysis of three learning theories. I begin with an overview of the relationship between learning and the meta-learner. I identify the elements of interest in understanding the relationship between learning and students progress toward becoming a meta-learner that will be explored in this analysis. I describe and apply as the framework for the analysis of learning necessary for the meta-learner, conceptual model research, a type of inquiry involving conceptual modeling and analysis. As a starting point for the discussion of the linkages to learning necessary for the development of the meta-learner as an academic outcome of higher education I offer a conceptual map of the meta-learner (Figure 4-3). I develop and evaluate conceptual maps with each of the three learning theories superimposed. At the end of the chapter

I summarize this analysis in a table by offering a synthesis of the relevant attributes of the meta-learner and learning theories.

One of the important characteristics of a concept map is the ability to add a specific example to help clarify the meaning of a given concept (Novak & Cañas, 2006). This analysis contributes to understanding student development as a meta-learner by examining the implications of conceptualizing learning from the perspective of three specific learning theories. Employing a conceptual model approach (Meredith, 1993), the individual, social constructivist, and activity learning theories are each examined for their contribution to understanding learning within the conceptual framework of the meta-learner. How existing learning theory might contribute to student development as meta-learners is considered.

In Figure 4-1 I offer as a point of departure for the analysis a simplified representation of the relationship between the learning process and the meta-learner that needs to be explored within the context of knowledge uncertainty and complexity.

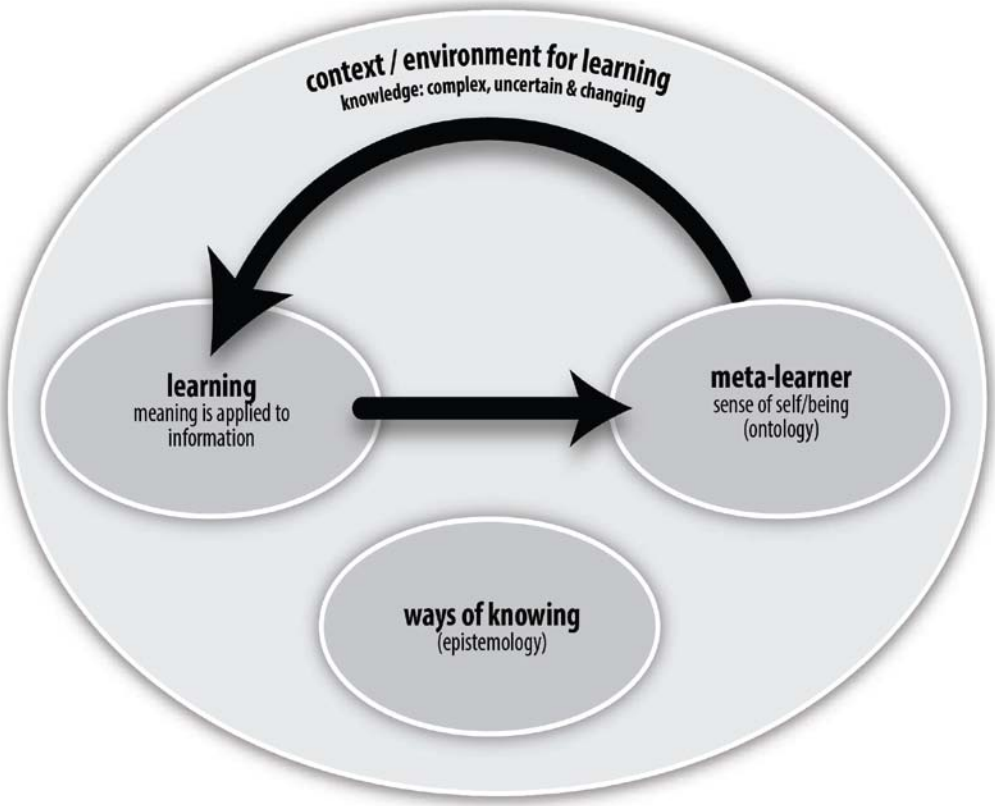

Figure 4-1. Relationship between learning and the meta-learner

In Figure 4-1 I offer a visual representation of the anticipated iterative relationship between the meta-learner and learning. The act of learning is assumed to influence and at the same time be influenced by the learner. Learning happens within a context and environment of knowledge uncertainty and complexity.

Understanding basic belief systems involves examining the relationship between the individual and the world, including exploring the interaction between ontology and epistemology. I examine the development of the learner and sense of self within the learning process keeping the skills and cognitive abilities of the meta-learner central. I consider how the iterative relationship between ontology and epistemology anticipated for the meta-learner is accommodated within each theory.

Understanding Learning and the Meta-learner

In Figure 4-2 I identify the elements of interest in understanding the relationship between learning and the meta-learner. Based on my discussion of metacognition and learning in Chapter 2, I anticipate that beliefs about knowledge, the ways of knowing, the purpose of learning, and the relationship between ontology and epistemology as conceptualized within each learning theory have important implications for facilitating student capacity as a meta-learner. These beliefs together provide insight into the epistemological understanding of what knowing means within each theory. How these beliefs may contribute to the development of intellectual values and cognitive dispositions that support engagement in knowing the world is instrumental to understanding how the learning theory applied might facilitate student development as a meta-learner.

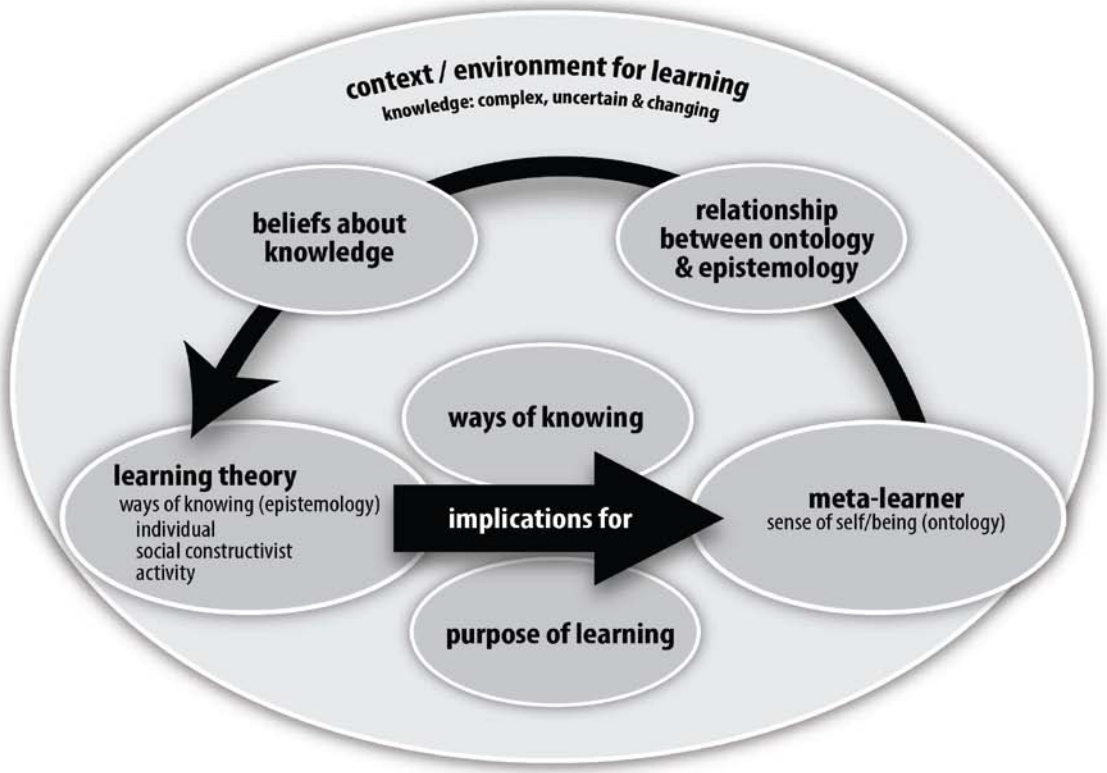

Figure 4-2. Elements of interest in analysis of learning theories and the meta-learner

In Figure 4-2 I assume the current context for learning to be one where knowledge is complex, uncertain, and changing, and requires the meta-learner to consider alternate

perspectives and ways of knowing the world. Ontology interacts with epistemology through the process of learning to continually shape the sense of self. As the sense of self evolves, how the individual understands and knows the world changes. The meta-learner as discussed in Chapter 2 requires the capacity to engage in reflective judgement underpinned by beliefs about knowledge and cognitive development available at the evaluativist level. Examining the ontological and epistemological assumptions associated with the theories of learning provides insight into the belief systems guiding the process and meaning of learning. Understanding current learning theory within the context of prevailing conceptions of knowledge provides the basis for exploring how the process of learning might contribute to achieving the necessary outcomes of higher education.

Conceptual Model Research

I introduce conceptual mapping here to organize and structure the new knowledge developed thus far related to the conceptual framework of the meta-learner. The concept map is a holistic, structural representation of the meaning attached to the concepts (Novak & Cañas, 2006). I apply the concept map here to conceptualizing the meta-learner as the basis for considering the relationship between learning and facilitating student capacity as a meta-learner. The concept maps themselves are a skeletal representation of the facets of learning and are not a detailed schematic of the relationship between development of students as meta-learners and learning. I explore the anticipated relationship between the various approaches to learning and the facets of the meta-learner in the discussion associated with each concept map. I describe the implications of each approach to learning for facilitating development of students as meta-learners.

To describe my approach to examining the three theories and development of a conceptual framework for the meta-learner I borrow from the information management work on conceptual model research (Meredith, 1993). This research informed my thinking regarding the focus and demarcation of my conceptual examination. Within this work I adopt both philosophical conceptualization and conceptual systems analysis to provide some insight into the process I undertake here. My analysis combines these conceptual research methods by examining the underlying assumptions about knowledge and knowing associated with the three approaches to learning within the context of considering the contribution the theories make to

understanding and aiding the rethinking of learning for the purpose of facilitating student capacity as a meta-learner in higher education. In the following pages I discuss the learning theories and concepts to be applied in detail.

Meredith (1993) referred to *philosophical conceptualization* as conceptual modeling for the purpose of theory building through philosophical reflection (p. 8). Meredith described philosophical conceptualization as involving the consolidation of different work on a topic by considering common attributes and identifying differences and extending the thinking by adding a concept or proposition to the current body of knowledge. This mode of conceptual analysis offers the opportunity to explore and reflect on the contribution each of the three theories of learning make to rethinking learning in the current environment where the meta-learner is a desired academic outcome. When superimposing on the concept of learning each of the three learning theories there are unique implications for the contextual process and meaning of learning. The assumptions about the relationship between learning and development of student capacity as a meta-learner are unique within the conceptual framework. The linkages between concepts reflect the assumptions underlying the meaning attached to a particular conception of learning and are therefore different in each resulting map.

Meredith (1993) identified *conceptual systems* as an approach employed to evaluate conceptual frameworks. Conceptual systems analysis looks at the multiple explanatory relationships among the concepts of the conceptual framework and the implications of the plausible relationships for the functioning of the system. Conceptual systems as a method of evaluating conceptual frameworks is well suited to exploring how the complex and tentative relationship between the learner and the world is anticipated within the bodies of learning theory. Each learning theory signifies a different explanatory relationship between learning and the conceptualization of student development as a meta-learner. Superimposing each learning theory and the associated epistemic views on the conceptual framework of the meta-learner makes it possible to consider the implications of each theory within the system for student development as a meta-learner. It becomes possible to undertake a reflective examination of the relationship between learning and the meta-learner by considering the implications of each learning theory for the functioning of the entire conceptual framework.

Meredith (1993) defined *concepts* as bundles of meanings attached to a phenomenon that aid in understanding and sharing of these underlying meanings. She distinguished *constructs* as concepts that cannot be observed but are inferred from observable activities. The meta-learner is a construct that is inferred through demonstrating skills and cognitive processes associated with intentional, integrated learning. The analysis of existing theory provides the foundation for extending the thinking around the concept of learning in higher education when the construct of meta-learner is a desired academic outcome. With these considerations in mind, I offer based on the discussion in Chapters 1 and 2, a conceptualization of the meta-learner and the meta-learner's relationships with learning as a starting point for this analysis.

Concept maps or frameworks are hierarchically organized representations of the relationships between concepts linked together to delineate the contextual meaning of a specific domain of knowledge (Deshler, 1990; Novak, 1990; Novak & Cañas, 2006). By organizing and structuring knowledge, concept maps articulate and clarify the meaning of objects or knowledge within a domain, a metacognitive strategy that can facilitate understanding of the knowledge (Novak, 1990). Words are used to link the concepts and explain the relationship or meaning associated with connecting the two concepts within a given context. These linkages are referred to as propositions, and taken together represent the contextual meaning the individual attaches to the concepts within a specific ideational framework (Novak, 1990, Novak & Cañas, 2006). Meredith (1993) believed frameworks are distinguished from models in that while models provide a description, frameworks go further and offer an explanation of the phenomenon based on the relationships observed between the elements within the conceptual framework.

Novak and Cañas (2006) argued meaningful learning can be facilitated and powerful knowledge frameworks created through conceptual mapping of interacting concepts and pieces of knowledge. Concept maps are useful for scrutinizing the assumptions made about the relationships between concepts and how individuals think about those concepts (Deshler, 1990). Cross-links is the term used to describe these linkages between concepts in different segments of the concept map and delineating these linkages facilitates creative thinking around new meaning relationships among knowledge within a domain. In evaluating the assumptions underlying the meaning attached to the concepts within different segments of the conceptual framework the relationships between the concepts may be reconceptualised creating new knowledge within the

domain and new cross linkages. The process of scrutinizing the underlying meanings of relationships between concepts and the active search for new linkages (ways of knowing) between pieces of knowledge supports the meta-learning anticipated to be necessary for learning when knowledge is uncertain and complex, and is a means of facilitating meta-cognition.

Conceptualizing the Capacities of the Meta-learner

Figure 4-3 is a conceptual map where I identify the salient capacities required of the meta-learner based on the discussion in Chapter 2.

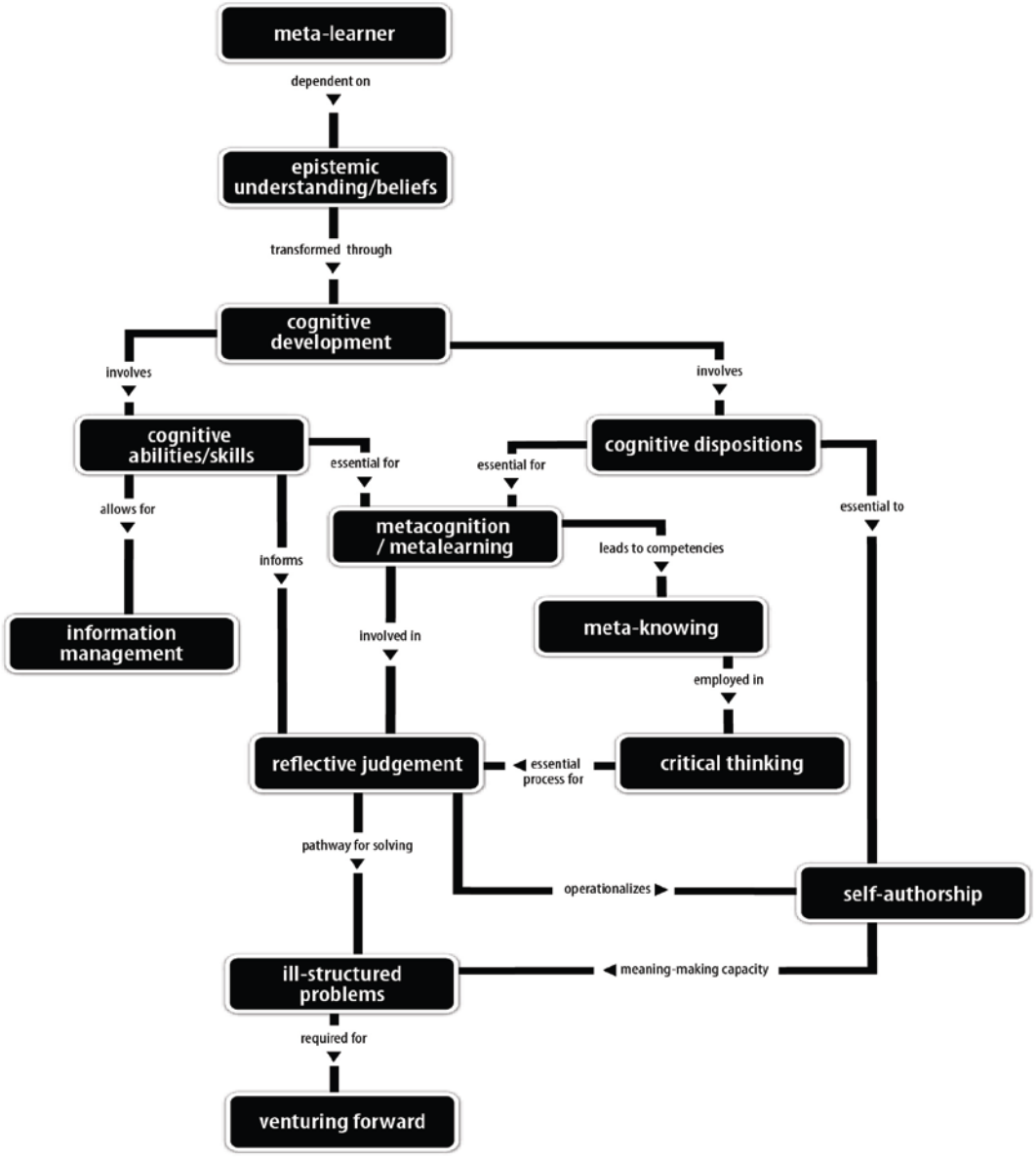

Figure 4-3. Facets of the meta-learner

The skills and cognitive abilities required by the meta-learner to engage with the world have epistemological implications related to personal beliefs about knowledge and knowing. An individual's conceptions of knowledge are instrumental to the strategic learning process (Hofer, 2004; Kardash & Scholes, 1996); and in particular these conceptions influence the functions of higher-order thinking and problem solving. As I illustrate in Figure 4-3 student capacity as a *meta-learner* is dependent on the learner developing *epistemic views* and *beliefs* that acknowledge multiple perspectives and ways of knowing are possible. A basic premise of the framework is that knowledge is uncertain and open to constant re-evaluation based on evolving evidence and arguments. These beliefs determine the approach to thinking and knowing influencing the learner's capacity for interpreting and evaluating information.

As I presented in Chapter 2, the transformation of these epistemological views is thought to be associated with *cognitive development*. *Cognitive skills and dispositions* are the two essential but distinct components of cognitive development necessary for student capacity as a meta-learner. As the learner moves to more complex epistemological assumptions, the individual is able to engage in *metacognition* including *metalearning* necessary for developing the *meta-knowing strategies* employed in *critical thinking*. These metacognitive skills involve an awareness and understanding of one's own and others' knowing. Metacognitive skills are essential to critical thinking when it is necessary to apply consistent criteria of argument and evidence to evaluating assertions about reality. *Reflective judgement* is a form of inquiry that utilizes critical thinking and metacognitive strategies to construct knowledge through the ongoing evaluation of relevant evidence and arguments from diverse knowledge domains. *Self-authorship*, the capacity to take ownership over one's ways of knowing and knowledge by internalizing the meaning-making process, requires intrapersonal capacities that are associated with specific cognitive dispositions. Authoring one's own life is operationalized through cognitive capacities associated with reflective judgement and connected to the knowing of others through shared social learning. In the current environment where *problems are ill-defined* and complex, it is through reflective judgement that the learner is able to consider multiple

perspectives and arguments. Evaluating these perspectives and arguments to reach conclusions and make decisions is necessary for the learner to *venture forward* in the current context of knowledge uncertainty, complexity, and change.

Linkages to Learning

This map however represents only one domain of the conceptualization of the meta-learner. There are important linkages to learning that are fundamental components of the conceptual framework for student development as a meta-learner that need to be added. Learning within this conceptual framework is about identity construction including the development of epistemological understanding and beliefs about knowledge as complex, uncertain, and changing. How these ontological and epistemological beliefs develop and change becomes an important element of the meta-learner conceptual map. I describe in Figure 4-4 an expanded conceptual framework for facilitating student capacity as a meta-learner. I incorporate into the map the anticipated needed linkages to learning when knowledge is uncertain, complex, and changing.

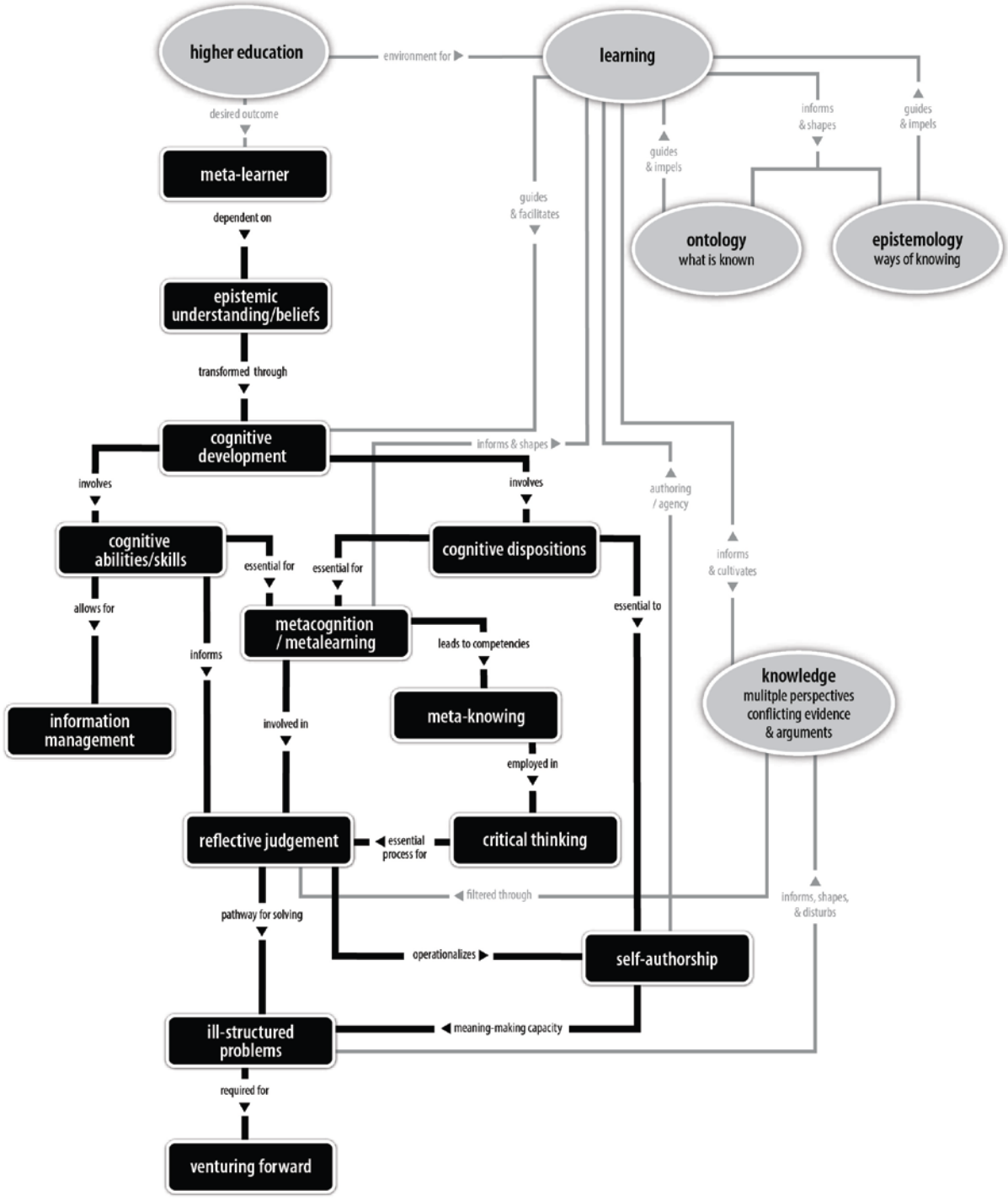

Figure 4-4. Learning for the meta-learner

In Figure 4-4 I map the key linkages anticipated between the meta-learner and learning. *Knowledge* takes the form of *multiple perspectives and assertions*. It requires an epistemological understanding at the evaluativist level (Kuhn, 2001). The thinking disposition of the meta-learner involves actively seeking out and considering multiple alternative perspectives and possibilities that are known to exist, and being open to switching perspectives. Capacity as a meta-learner requires willingness to do what Stanovich (2010) referred to as decontextualize or stripping away of the context from the problem such that prior knowledge and experience does not bias the thinking. The thinking disposition associated with the meta-learner necessitates a belief that knowledge is uncertain and changing, but that through *reflective judgment* it becomes possible to evaluate alternatives to determine based on the supporting argument and evidence that one perspective has more merit within the current context. These knowledge judgements remain open to re-evaluation as new evidence and arguments are made and considered.

With knowledge anticipated to be uncertain, complex, and changing, *ontology* and *epistemology* are expected to have an iterative relationship of influence with *learning*. While *learning* shapes and informs *ontology* and *epistemology*, these constructs of knowledge and knowing at the same time guide and drive the learning process. *Learning* instead of creating certainty and stability in terms of what is known and how it is known induces further uncertainty and flux for the knower making linkages back to the *meta-learner* to allow for the employment of *cognitive skills* essential in the meaning-making process. Understanding personal knowing and the knowing of others is instrumental to creating meaning when ontology and epistemology are in constant flux. *Self-authorship* as I presented in Chapter 2 is the cognitive capacity for examination and reflection that provides the learner with the capacity for creating a personal level of comfort with the uncertainty of knowledge and knowing by controlling personal ontology and epistemology. This ownership and control over the learning process and the learning outcomes provides a sense of security and meaning for engaging with the world. The value of learning becomes discernible providing the impetus for further learning. The conceptual map of the relationship between the meta-learner and learning becomes recursive in nature.

The conceptual map depicts the relationship between the *meta-learner* identity and *learning* as a perpetual evolving cycle propelled forward on its own reinforcement/inertia. The process of learning has an instrumental role to play in the evolving understanding and

construction/reconstruction of knowledge, self, and knowing. Employing metacognitive strategies in *reflective judgement* allows the learner to take ownership over the learning process creating a sense of agency and control over knowing.

The sense of agency provides the confidence to author the learning process. It is only when the learner is confident in understanding the basis of his or her own decisions and judgments about evidence and arguments, as well as those made by others, that he or she can be open to exploring alternative explanations. The learner incorporates this exploration into the personal construction and reconstruction of knowledge and evaluation of beliefs about truth. The dispositions that I have associated with the meta-learner are important to a learner being able to employ the cognitive abilities and skills associated with critical thinking and reflective judgement essential for knowledge creation. These competencies are only necessary if the learner possesses the supporting dispositions to employ them. Underlying these dispositions is a valuing of inquiry and knowing. These dispositions when combined with the appropriate cognitive skills are the engines for self-authorship that provide not only the capacity but also the motive for engaging in further learning, and open the learner to exploring the uncertainty and complexity of the world.

Individual Learning Theory Applied

Individual learning theory as I presented in Chapter 3 assumes that one certain reality exists external to the individual. With knowledge and reality anticipated to be externally constructed and structured, how reality is known is determined by the context of the knowledge. Ontology or reality is assumed to dictate epistemology. Although knowing, knowledge, and learning reside inside the mind, knowledge is conceived of as structured in pre-existing mental constructs adopted by the learner such that there is no need to consider how the learner knows. Alternate ways of knowing are irrelevant.

The purpose of learning within individual learning theory is to acquire pre-existing structures of knowledge. Individual learning theory perceives learning as the processing of external knowledge structures. The learning process involves the transmission of information from the knowledge holder to the receiver. In Figure 4-5 I impose the individual learning theory on the conceptual mapping of the anticipated relationship between learning and the meta-learner.

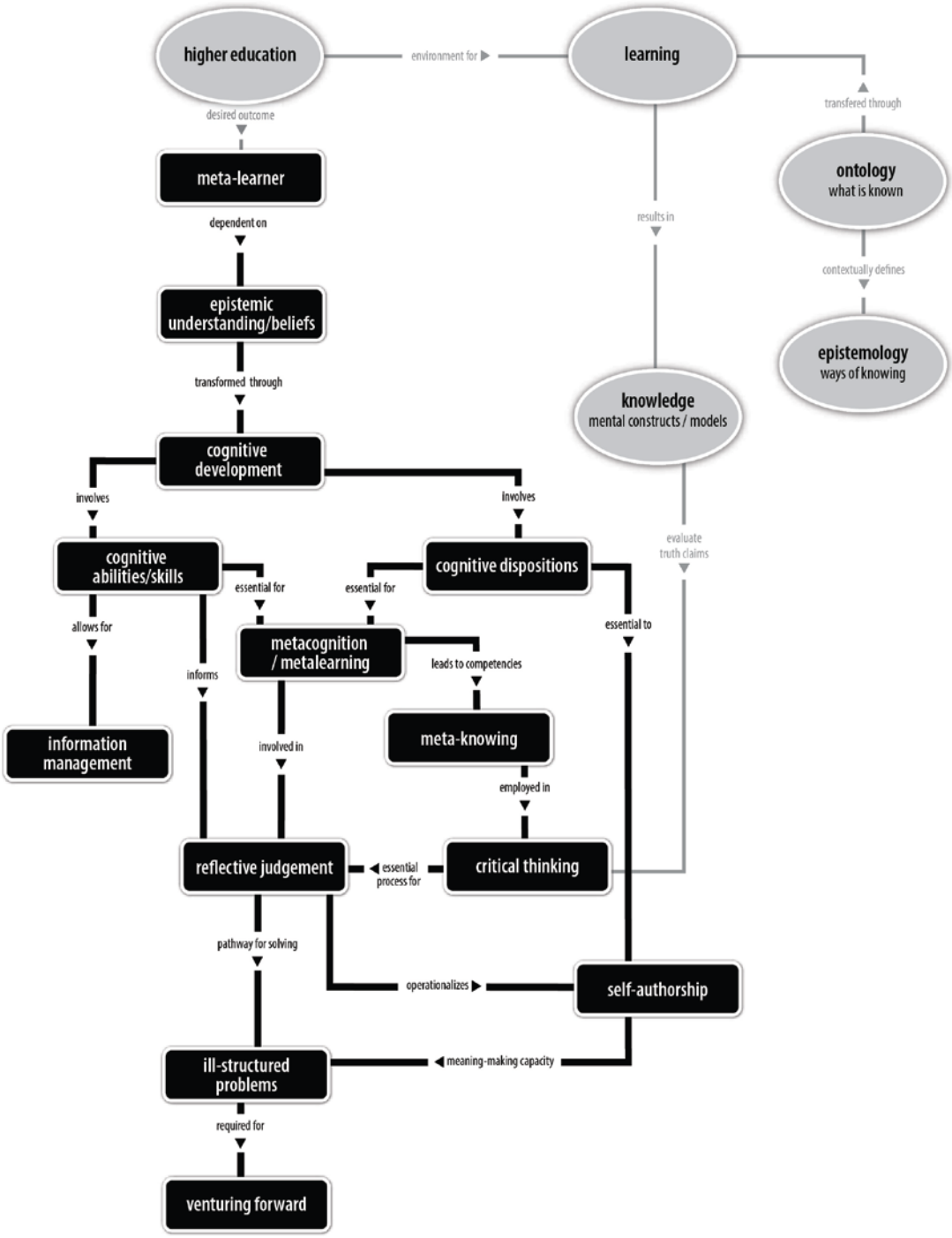

Figure 4-5. Individual learning theory and the meta-learner

As I illustrate in Figure 4-5, when I superimpose individual learning theory on the conceptualization of the relationship between *learning* and the *meta-learner* there is a unilateral flow of knowledge through the learning process to learner. Learning is assumed to be "individual", centered within the individual, and serving the learner's personal needs. Engaging in learning is purposeful, is specific to a task or desired outcome, is undertaken when the individual identifies a need for specific information, and is ceased when the goal is reached and the associated knowledge obtained. The linkages between concepts reflect the implications of applying individual learning theory to the conceptual map. *Knowledge* is assumed to be certain and transmitted through learning in the form of *mental models* and *constructs* to the mind where it is stored and used. The connection between the learner and knowledge is through mental constructs that are internalized and evaluated for their truthfulness through critical thinking.

When knowledge is assumed to be certain and externally structured the need for metacognition, thinking about how one knows becomes redundant. Knowledge structures pre-exist and are adopted within the context in which the knowledge exists. The merit of alternative perspectives is not a consideration, but instead knowledge structures are evaluated independently based on whether they represent the truth. Newly acquired structures will replace existing knowledge constructs in the mind if determined to be valid. Individual learning theory does not generate multiple perspectives but rather seeks to eliminate alternatives through critical thinking in the search for the truth. *Ontology* is sought as one the truth or reality, and transferred to students through learning. *Ontology* contextually defines *epistemology*. Objective events and experiences determine how the learner knows. *Ontology* and *epistemology* are assumed to be stable and unchanged through the learning process.

The assumption that knowledge is certain is in direct conflict with the basic premise of the *meta-learner* framework in which knowledge is uncertain, complex, and changing. The relatively stable mental models of knowledge anticipated here when individual learning theory is superimposed on the framework contrasts with the fluid nature of knowledge in the form of multiple perspectives shown in Figure 4-4. The conceptualization of knowledge as volatile and uncertain has important implications for the relationship between learning and the meta-learner in the framework.

For the meta-learner *self-authorship* is an important capacity when knowledge is tentative and tumultuous. Self-authorship is closely linked to the cognitive ability for *reflective judgement* necessary to evaluate the multiple perspectives and assertions that are assumed to exist when knowledge is complex, uncertain, and changing. *Ill-structured problems* that do not appear to have one obvious and definitive answer exist, and the process of working with these problems feeds the uncertainty and complexity of knowledge. However, when knowledge is perceived as certain, problems are assumed to be solvable through the discovery of the truth. With a definitive and externally defined truth, it becomes unnecessary for the learner to have any influence on what can be known and how it can be known.

The conceptual map of the meta-learner and learning in Figure 4-4 suggests a continuous loop with learning. Knowledge within the map is impelling the learning process, and at the same time knowledge is influenced and shaped through learning by the learner and the existence of ill-structured problems. The uncertainty, complexity, and changing nature of knowledge create an imperative for the meta-learner to solve ill-structured problems, a process that informs, disturbs, and shapes knowledge. The circular, recursive flow from meta-learner back into the learning process through *self-authorship* I depict in Figure 4-4 may no longer be necessary when individual learning theory is applied and knowledge and knowing are assumed to be certain.

Learning within the individual learning theory is the processing of external knowledge models by the mind. Similar to building blocks, the learner adopts and discards chunks of knowledge after the mind has evaluated each block based only on its truth as externally defined by experts. While both the meta-learner framework I propose in Figure 4-4 and the individual framework in Figure 4-5 have a role for critical thinking in learning as an internal process of the individual mind, the purpose is quite different within each conceptualization. Within the proposed meta-learner framework the role of critical thinking is to aid in evaluating the merit of alternative perspectives based on evidence and arguments. In contrast the individual learning theory framework has the role of critical thinking as evaluating the truth of knowledge structures based on the assumption that the knowledge can be unilaterally judged as either true or false using objective evidence. Learning is assumed to be purposeful, specific to the task, and focused on knowing the truth. When I superimpose these beliefs and purpose for learning on the framework in Figure 4-5, the learner would not necessarily be open to or actively seeking out

new or alternative perspective, arguments, or evidence. This is in contrast to the meta-learner conceptual framework in Figure 4-4 where I depict learning as an iterative process.

Individual learning theory postulates that a person's learning is controlled through the learner's capacity and willingness to learn, but these cognitive dispositions and capacities develop independent of the learning process. Tools and skills for processing information can be learned as pre-existing mental models are adopted, and applied to new situations. The mind's capacity for learning and information processing is facilitated when cognitive structures are altered through learning.

Self-authorship as defined by Baxter Magolda (2009) involves interpersonal capacities that include the ability to consider, understand, and value the perspectives of others. The concept of self-authorship within the individual learning framework shown in Figure 4-5 would be conceived of as a gatekeeper role for learning and knowledge construction as opposed to a driver of these activities as anticipated in the meta-learner framework. Learning, within the individual learning theory, is for the purpose of being able to respond to or act upon the world for personal gain. Learning is assumed to reside within the individual in contrast to the proposed meta-learner framework that assumes a social dimension to learning and knowledge creation.

When considering the role of learning in developing both cognitive dispositions and skills, individual learning theory views cognitive development as independent of the learning process. Learning occurs within the mind and results in the development of mental models that are employed in critical thinking for evaluating the truth of pre-existing knowledge claims and therefore developing values that support inquiry and analysis related to knowing strategies may be seen as less important for the learner. The belief structure assumed by individual learning theory makes it unnecessary to engage in objective evaluation of the merit of arguments and multiple perspectives.

The static and objective nature of reality assumed by individual learning theory makes it possible to employ algorithmic level processing (Stanovich, 2010) in critical thinking to evaluate truth as opposed to the reflective judgement and self-authorship assumed to be necessary for the meta-learner in the age of supercomplexity. Learning under this framework would not be expected to specifically focus on development of cognitive capacities and meta-cognitive functions. When individual learning theory is employed in academia the content of learning

would be adopting the mental models of pre-existing knowledge structures and the process of learning would involve the acquisition of discipline specific knowledge. Cognitive ability to undertake the algorithmic processes necessary to acquire and incorporate the knowledge structures of a specific discipline is anticipated to be the focus of learning. Development of thinking dispositions, including attitudes toward learning and knowing, would not necessarily be learning objectives or direct outcomes of the learning process within this framework. Identity construction and development of the student as a meta-learner, if it occurred, would be assumed to be coincidental.

Social Constructivist Learning Theory Applied

Learning for the social constructivist is the social activity of participating and it occurs through the interaction between people not within the mind. Knowledge is created through the activity of participation and therefore is not an object but rather exists only within the social context where the knowledge is given meaning. However it is the mind that ultimately attaches meaning to those social experiences based on the learner's experience and the dynamics of the learning situation. Knowledge is transient, existing and given meaning only within the activity in which it was created.

Learning is an ongoing, unavoidable process that occurs as individuals participate and engage in social interaction. Ontology, what is known, and epistemology, how it can be known, are co-created through the learning process. The content of learning is coming to know, knowledge, and identity construction through social interaction, existing only within the social context in which they are created. The goal of learning is to successfully participate. In Figure 4-6 I superimpose social constructivist learning theory on the conceptualization of learning and the meta-learner as an academic outcome. The relationship between learning and the meta-learner is again defined as a result of the belief structures this theory imposes on the framework.

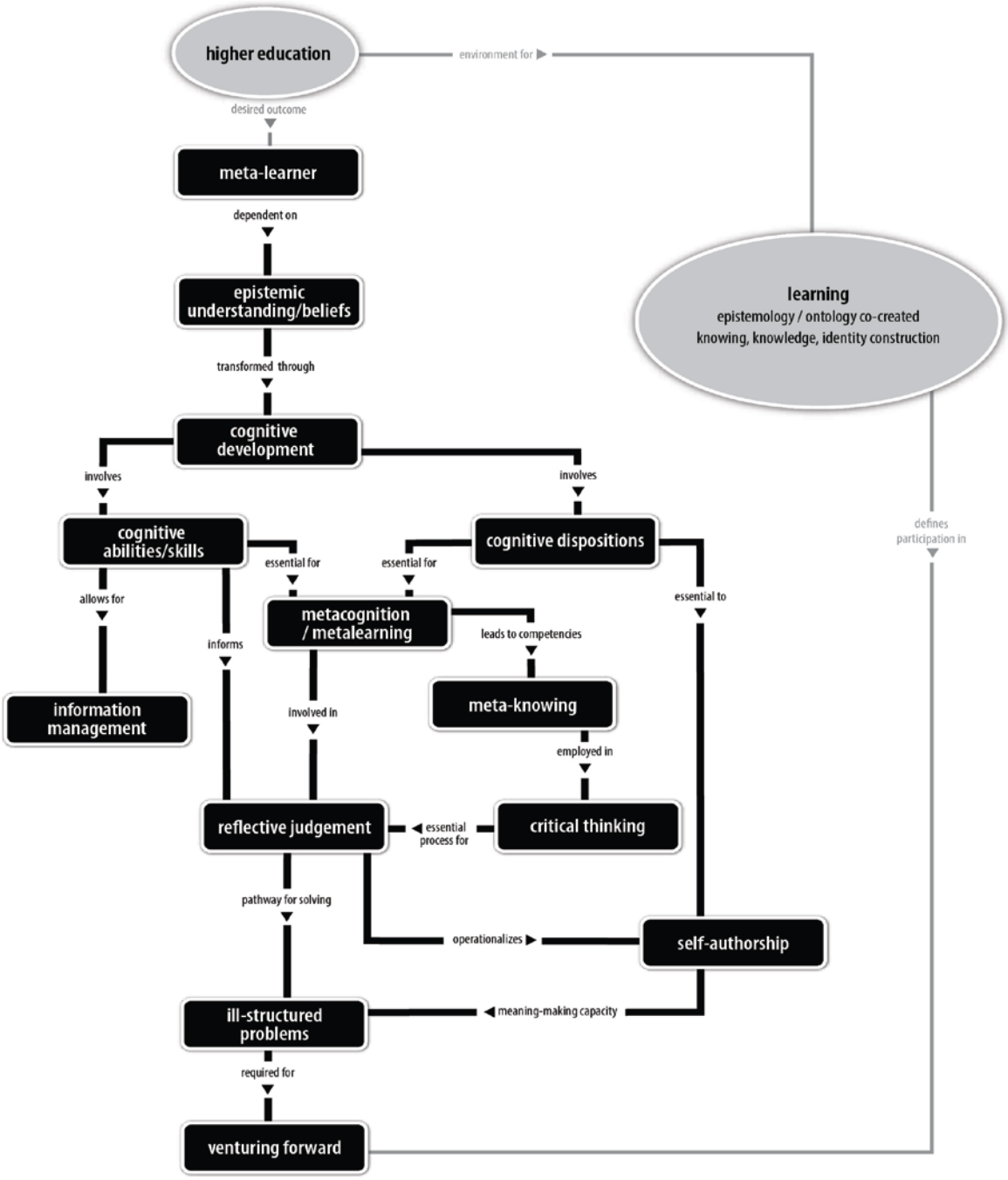

Figure 4-6. Social constructivist learning theory and the meta-learner

In the relationships I illustrate in Figure 4-6 it is through participation that learners become the producers and at the same time products of the patterns of socially acceptable interactions within a given social setting or group. By participating in social interactions the individual is constantly learning how to act, including defining what constitutes as knowledge and how it can be known. *Ontology* and *epistemology* are co-constructed through the process of *social learning*. How individuals need to act, who they need to be, and in turn how they see themselves, is constructed and defined through the interactions. The sense of self or identity of the learner is contextually defined within the interactions and does not exist outside these activities. The learner's identity is transient based on the context in which it is created and supported through successful participation. The construction of self is part of the process of engaging in learning but is not assumed to be a conscious, objective outcome of learning.

Learning to successfully participate is both the content and desired outcome of the process. It is the individual's desire for social interaction and acceptance that drives participation in learning but learning occurs exclusively in the social arena. *Ontology* and *epistemology* although subjective are contextually co-constructed and known by the learner within the social activity in which they were generated. Learning for the social constructivist creates a certain fleeting stability to *ontology* and *epistemology* within the learning activity. The learning situation creates certain specific possibilities for knowledge and knowing.

Metacognition, understanding one's own cognitive processes, is given little attention within the theory, as it is the experience of participating that shapes how participants know and understand things. Cognition is conceived of as being more collective, with the world constructing the individual (Davis & Sumara, 2002). Learning is the process of coming to know and therefore knowing exists only within the experience in which it occurs.

The goal of learning within this framework is coming to know in such a way that the individual is able to successfully participate as a member of the social activity. How the learner knows is only relevant to the extent that it allows the individual to participate. Alternative perspectives are assumed to exist but awareness and acceptance of them is limited to the role these perspectives might play in allowing the individual to participate effectively. Alternate ways of knowing are only sought to facilitate successful participation. Actively seeking out and understanding how others perceive things is of value to the extent that it allows the learners to

alter their own way of knowing to effectively interact in the particular social context. Engaging in learning for the purpose of developing beliefs and attitudes related to knowledge construction and knowing such that it is possible to undertake metacognition may be considered unnecessary within the social constructivist's conceptualization of learning.

The idea that knowledge construction is a collective activity and that knowledge exists only within the interactions in which it is created implies that knowledge is complex and contextually changes. As an activity rather than an object, knowledge is uncertain and subjective in that it cannot be defined outside the social interaction in which it was created. The subjective nature of knowledge makes multiple perspectives and realities possible. However, with knowledge not perceived as an object, but rather a co-constructed way of knowing within the context that cannot be readily transferred to other situations, the implications of it being uncertain, complex, and changing are anticipated to be significant to the learner only within the current learning situation.

It is the temporal and contextual nature of knowledge and knowing in social constructivist learning theory that makes the activity of *reflective judgement*, and capacity for *self-authorship*, as defined within the meta-learner framework, irrelevant as a goal of learning. The meta-learner framework assumes knowledge has both an objective and subjective component that must be reconciled, implying a more stable and constant sense of self and reality. The social constructivist assumes multiple perspectives exist and are equally valid making this evaluation and reconciliation unnecessary. To entertain the concept of epistemological development is to assume an ontological conception of it (Hofer, 2005). It must exist as an object outside the context of the situation if it is to be something that can be worked on and developed. The assumption of cognitive capacities as an ontological construct is not consistent with the social constructivists beliefs that knowing is subjective and contextual.

Self-authorship assumes individuals direct and own their learning and development through internal meaning-making of knowledge and knowing. While social constructivist theory supports the process of individual meaning-making within learning experiences, there is a reliance on social relationships with others to define and co-construct that meaning based on certain acceptable possibilities for action within the given context of learning. As a result, social constructivist theory has limited application for understanding the incentives for learning when

new knowledge creation is the goal (Davis & Sumara, 2002). The purpose of inquiry is to learn how to participate within social situations, with addressing *ill-structured problems* and knowledge creation of limited relevance beyond immediate participation. Complex problems may arise within a given context, but can only be understood within that context, and therefore the ability to develop general cognitive capacities and conceptual knowledge to address these issues would have little relevance as a desired outcome of learning.

Cognitive development is important to the extent that it contributes to participation by the learner. Multiple perspectives are assumed to exist amongst participants and considered to be equally valid making it unnecessary to employ knowing strategies to evaluate these perspectives and determine their relative merit. The individual requires not the disposition of a learner capable of reflecting on and judging diverse knowledge claims but rather the capacity to act appropriately within the particular context. Rather than evaluate the multiple perspectives and sources of knowledge for their merit, the social constructivist seeks to negotiate personal understanding within the confines of the activity for the purpose of achieving a co-constructed knowledge and way of knowing that is acceptable to participants.

The very contextual and transient nature of knowing assumes the learner must constantly focus on present participation. The *disposition* and *cognitive skills* required and adopted will be learned and applied within the context as needed. *Critical thinking* is employed to evaluate the current experience relative to past ones, reconciling these activities to determine what actions are appropriate within the given context.

Assuming it is the activity that holds the context for learning, social history and context beyond the immediate interaction would have no implications or relevance. The sense of self as a learner is determined within the context of the learning situation, guided and shaped by the interactions with others. The need to develop a more stable identity as a meta-learner would not be the desired outcome of learning in academia as the assumption is that the required disposition would be adopted as a result of successful interaction with others within a given social situation.

Academia provides the opportunity for students to participate in activities that socialize and prepare them for participation within a given discipline or profession. A personal drive for learning and inquiry is not of primary importance as an outcome because it is the desire for

successful participation and collective social milieu of the particular discipline that will guide the actions and identity construction of the learner.

When applied in academia, the purpose of learning is to know how to participate as opposed to acquiring specific knowledge. It is not necessary to develop a general disposition for employing knowing strategies and undertaking inquiry as it is the social context of the professional practice the individual engages in that will shape the knowing and inquiry for successful participation. The cognitive skills and tools for successful participation within a particular context are the focus of learning, not the development of general knowing strategies associated with metacognition.

Activity Theory Applied

Drawing from the beliefs of both the positivist and constructivist paradigms, activity theory holds that learning is a social process and learning only occurs through participation in activities, but that to participate in the world it must exist and therefore reality has an objective component. Although learning is contextual, it is grounded in the cultures and histories brought by participants to a learning experience which shape and inform the learning process. The act of participating involves knowing, which influences what is known and how it is known, such that both ontology and epistemology are shaped and informed through learning. How the participants know will influence what can be known and what is known will influence how it can be known. The context in which learning occurs is a product of history and the current social interaction. Individuals bring to the learning social and cultural history that is used to co-construct new knowledge and meaning based on the act of participating. Capacity for learning is determined by both the quality of the activity itself, and what capacities and history the individual brings to the situation. I show in Figure 4-7 the relationship between the meta-learner and learning anticipated when activity theory is imposed on the conceptual framework.

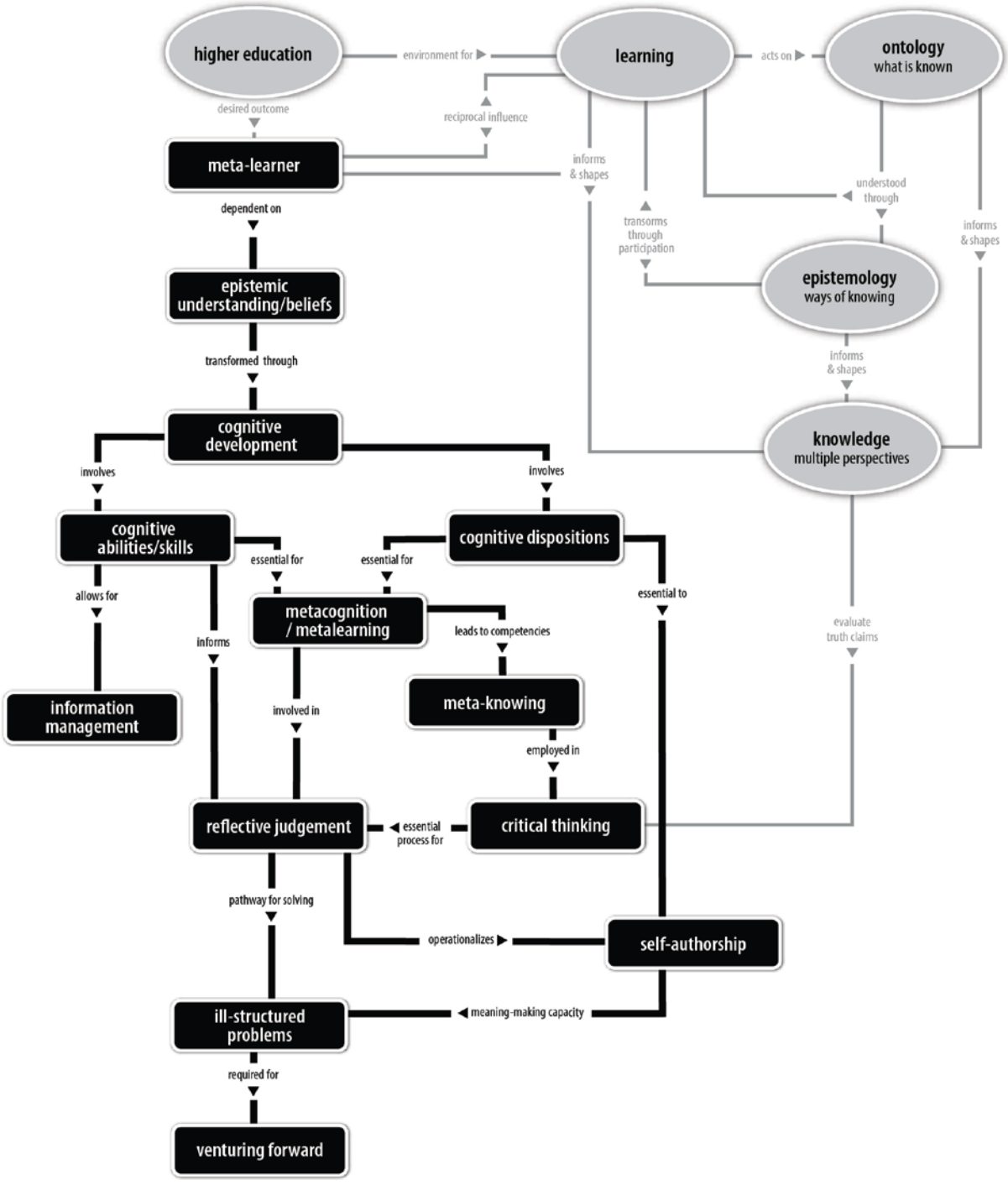

Figure 4-7. Activity theory and the meta-learner

The objective and subjective nature of learning associated with acknowledging that context has a historical component results in a more dynamic relationship between the learner, the learning process, and knowledge creation as shown in Figure 4-7. *Knowledge* influenced by *ontology*, *epistemology*, and *learning* takes the form of multiple perspectives that must be internalized by the individual and evaluated such that it can be incorporated into personal history and used in future experiences.

Adding the historical component to learning suggests that *ontology* and *epistemology* that exists outside of the learning process may be influencing knowledge. Participation in inquiry is influenced by *epistemology* and at the same time transforms how the learner knows. *Ontology* is objective but only understood subjectively through the ways of knowing employed in the inquiry.

The influence of the learner on the process and content of learning implies a certain stability and independence of the student identity outside the learning activity. The social activity of participation does not exclusively define the content and process of learning. The learner brings to knowledge creation an influence through personal history and culture as well as participation in the social learning arena that shapes what is known and how it is known. The addition of a social and cultural component to learning brings the potential for a dialectical relationship between learning and the learner that requires *cognitive development* such that evaluation of the multiple knowledge perspectives is possible.

One of the limitations of social cultural learning theories including activity theory is that although existing culture and history are internalized and considered tools for learning, there is little consideration given to the active role of the individual mind in understanding and constructing new knowledge (Vosniadou, 2007). The individual is assumed to perform the internal meaning-making function although the social activity of participation is assumed to have the greatest influence on how the individual comes to know.

The acknowledgement of a social and cultural history that individuals bring to and utilize in the learning process suggests a developmental aspect to learning as the individual participates in, and internalizes, the learning experiences. To participate successfully requires an understanding of the cultural and historical context that the learner and other participants bring to the activity. Knowing in activity theory is neither discovered nor created, but is developed

through the process of engaging with the world. The need to incorporate the social experiences of participating into the learner's personal history of knowledge and knowing makes *cognitive development* a consideration for learning.

Learning as a process occurs through the act of participating in the world influenced by culture and history. The content of learning is the socially constructed meaning, which when internalized and reconciled with personal history and culture, shapes the sense of self. For academia, the goal of learning is successful active participation in the world. Given that participation has cultural and historical influences it is important to understand the context for learning. What is known and how it is known is significant. Learning is facilitated when the individual understands the metacognitive processes personally employed and those utilized by others. A disposition for undertaking inquiries into knowing to the extent that they facilitate participation in the world may be relevant and a valid objective of learning in academia.

Summation of Learning Theories Applied

I summarize in Table 4-1 the underlying assumptions of the three theories for learning providing the basis for a discussion of the implication of each theory for learning in higher education. This discussion offers a foundation for reframing learning and the process of learning to facilitate an understanding of how academic programs can contribute to student achievement and success as they develop as meta-learners.

Table 4-1. Synthesis of the Application

Approach to Learning	Beliefs/views of Knowledge	Ways of Knowing the World	Purpose of Learning	Relationship Between Ontology and Epistemology
Meta-learner	Knowledge is complex, uncertain, and changing. **Recursive view** – knowledge and knowing open to constant re-evaluation based on reflective judgement	Alternate ways of knowing the world exist, incorporated into knowing through reflective **judgment** involving metacognition.	Cognitive development that allows for knowing self, others, & the world.	Iterative relationship between ontology and epistemology as personal beliefs and sense of self are altered and reshaped through learning
Individual Theory	Pre-existing structures of knowledge. Knowledge is certain. **External View** – knowledge is external to the individual	Only one truth exists so the most accurate way of knowing the world is sought. Knowing is **discovered**.	Learning is the intentional acquisition of pre-existing structures of knowledge transmitted from provider to consumer.	Ontology (one external reality) determines epistemology (how it can be known). Epistemology is objective separate from the individual and sense of self.
Social Constructivist Theory	Knowledge is co-constructed through participation and only has meaning within the context in which it is created. **Internal View** – perceptions of objects shaped within the mind	Multiple ways of knowing the world are possible and determined by the participants through social interactions. Knowing is **created**.	Learning is the act of participating, creating a sense of self shaped by the interactions between participants	Epistemology (knowing through participating) determines ontology (shared social construct).
Activity Theory	Knowledge constructed through participation in the world influenced by culture and history. **Dialectical View** –interaction between external world/objects and internal interpretation by the mind	Alternate ways of knowing the world exist and influenced by norms, beliefs, culture, and past experience. Knowing **arises from the experience of living**.	Learning is the social activity of participation but influenced by cultural and historical context.	Ontology (objects and the individual's sense of being) and epistemology (knowing through activities and participation) have iterative relationship, influencing each other.

Meta-learner. I outline the assumptions and beliefs about knowledge and knowing underlying the imperative for the meta-learner in Table 4-1. For the meta-learner, knowledge is assumed to be complex, uncertain, and changing. Knowledge and knowing have a recursive relationship that makes the learner open to constant re-evaluation of both knowledge and knowing based on reflective judgement. Alternate ways of knowing the world are assumed to not only exist, but require the learner to both acknowledge and understand these perspectives such that these alternatives can be considered and incorporated into personal knowing and meaning-making. This process of considering and incorporating alternate ways of knowing involves

making judgements based on a contextual evaluation of the evidence and arguments associated with the different assertions put forward.

To understand the meaning-making of others and to undertake personal meaning-making requires engaging in metacognition, where the learner considers about how he or she thinks, how he or she learns, and how he or she knows. The learner is assumed to be an active participant in knowledge creation, both initiating and owning the process, and the content, of learning.

The purpose of learning for the meta-learner is cognitive development that makes it possible to undertake inquiries into knowing oneself, others, and the world. The focus is on engaging in a constant re-evaluation and transformation of knowledge, of sense of self, and of epistemic beliefs and assumptions in light of evolving evidence and understanding of alternate was of knowing the world.

There is an iterative relationship between ontology and epistemology as personal beliefs and values associated with the sense of self are altered and reshaped through learning. Ontology is assumed to be both objective and subjective with the mind engaged in interplay with the world and reality to evaluate the evidence. This evaluation process results in contextually transforming knowledge and sculpting the sense of self. Epistemology similarly has objective and subjective components as the learner reflects on existing ways of knowing. Through experiential participation in the world and engaging in metacognition the learner seeks out alternate perspectives and ways of knowing the world that facilitate the personal and social meaning-making processes.

Individual learning theory. Individual learning theory anticipates that knowledge flows unilaterally to the individual through the learning process. Knowledge is certain, and can be found in pre-existing structures in the external world. With knowledge assumed to be certain, knowing is determined by discovering the knowledge. While individual learning theory suggests the individual controls learning, which occurs in the mind through cognitive ability and willingness to learn, the learner as an identity is the passive, intentional consumer of knowledge transmitted from the producer to the learner. The information consumed is used to construct and modify mental constructs that can be drawn upon to inform future interaction with the world. Ontology determines epistemology or how the knowledge can be known. Epistemology is objective, and external to the individual and the construction of the sense of self.

Social constructivist theory. Social constructivist theory perceives knowledge as co-constructed through participation and that knowledge only having meaning within the context in which it was created. Multiple truths or realities are possible and exist only within the mind of the individual. Participants through their social interaction with others create multiple ways of knowing the world. Within the specific context of the current activity there is a way of knowing co-constructed through participation. It is this contextually constructed way of knowing that is relevant to participants and although other ways of knowing are assumed to exist they are not relevant to current participation and therefore not sought out or considered. Social constructivists advocate that learning occurs entirely in the social arena and while the learner makes the decision to participate in learning, the process, content, and context for learning are socially determined, and knowledge and knowing collectively owned. Learning is the act of participating, creating a sense of self shaped by the social interactions with others. The mind constructs meaning and interprets experiences with the objective of successfully participating in the social interaction. The focus of learning is on the act of participating, which constructs and transforms the sense of self. The contextual nature of knowledge and knowing negates the purpose of self-authorship and reflective judgement anticipated to be necessary for the learner to venture forward in an environment where knowledge is tenuous and complex.

Activity theory. Activity theory offers a subjective and objective nature to knowledge that is conducive to the learner seeing themselves as actively influencing the learning process and able to take ownership of the process when personal mean-making related to social learning occurs. Knowledge within activity theory is constructed through participation in the world that is objective and influenced by culture and history such that the individual's knowledge of the world is subjective. There is a dialectical view of knowledge assumed to be the result of the learner's interaction with the objective external world and internal interpretation of the world by the mind embedded in a personal culture and history. Learning is the social activity of participation, but it is influenced by cultural and historical context. The mind engages in an iterative relationship with the world drawing on experience, beliefs, and cultural norms as tools for understanding the world, and at the same time these tools are shaped through interactions with the world. The focus of learning is on social participation and experiences, which shape the sense of self, but within a cultural and historical context. The acknowledgement of the personal

and social dimensions to learning is helpful in understanding the potential role of reflective judgement and self-authorship in learning.

In summary, for individual learning theory the goals of learning is acquiring external knowledge and would support the development of the cognitive skills and tools necessary for knowing how to acquire and process information. The social constructivist and activity theory advocate social goals of participation that would support the development of cognitive skills that allow for successful engagement with the world. None of the three seems sufficient to justify the development of cognitive dispositions related to capacities for knowing as the content of learning and the desired academic outcome of facilitating student development as meta-learners.

Venturing Forward

Barnett (2011) stated that faith in the relevance of learning, and the hope that learning may be beneficial when engaging with the world, are what allow students to venture forward in learning. He believed that venturing forward requires six specific dispositions that allow for engaging intentionally with the world (p. 12). The six dispositions are: a will to learn, a will to encounter strangeness, a will to engage, a preparedness to listen, a willingness to be changed through learning, and a determination to keep going make it possible to authentically venture into learning (p. 11-12). The value of venturing forward in the age of uncertainty is the opportunity to explore, engage, encounter, and embrace the unfamiliar, and it requires the ability to live with doubt (p. 12). This will to learn is a dedication to *being* a student, an ontological commitment (Barnett, 2007).

The age of supercomplexity requires an understanding that knowledge is complex, uncertain, and changing. I argue that what is required today is a meta-awareness of the world, where learners actively seeks out and consider alternate perspectives, arguments, and evidence as they come to know themselves and others within the context of the global village. In this environment of complex and uncertain knowledge multiple perspectives and assertions are possible. All perspectives must be considered based on sound arguments and evidence such that the relative merit of each can be evaluated. This belief about knowledge is an underlying premise of the imperative for promoting the capacities of the meta-learner within academia. To achieve this requires an approach to learning that facilitates the cognitive development to support

the thinking disposition and cognitive skills necessary for self-authorship and reflective judgement.

Based on Barnett's (2011) argument as previously discussed, learning brings uncertainty and insecurity about previous understandings and expectations regarding the world, and the value of the learning process is questioned. It is the ability to engage in reflective judgement, to consider and evaluate alternatives using criteria of argument and evidence, which allows the learner to manage the state of active doubt. Employing reflective judgment the learner is capable of decisions about what counts as the most relevant truth in the current context, while still acknowledging that alternate points of view and frameworks for knowing the world are possible.

It is only through the development of cognitive skills and dispositions that allow for self-authoring and reflective judgement that the learner becomes comfortable with the awareness that alternate ways of knowing the world exist, willingly seeks them out, and engages in the process of understanding and entertaining those alternatives. Engaging in metacognitive processes, the individual becomes empowered to reorganize knowledge such that academic subjects become the avenues by which the learner reflect on his or her own problems, and the possibilities created by learning become known to the student.

When educators employ certain approaches to learning, those conceptions bring to the learning experience subliminal messages about what learning involves, and what knowledge is; and may or may not offer opportunities for identity construction. There are underlying beliefs about knowledge and how learners can know things that come with a specific approach to learning that educators are reinforcing for students. How these conceptions of knowledge and learning are conducive to the development of the desired cognitive skills is of relevance to the ability of learning to facilitate student development as a meta-learner.

The levels of epistemological understanding I outline in Chapter 2 are easily associated with the different conceptions of knowledge and knowing that underlie existing learning theory. Education is often associated with the rote transfer of information indicative of individual learning theory and the belief that knowledge is certain and stable. This may provide some insight into why attempts to encourage critical thinking and intentional learning among students have been sporadic and for the most part not sufficiently comprehensive to achieve the desired educational outcomes.

To this point I have outlined the need for the meta-learner in an environment where knowledge has no boundaries; identified the importance of epistemic beliefs and cognitive development for learning; provided an overview of three broad perspectives of learning; and considered the contribution of three theories of learning to understanding the relationship between the meta-learner and learning. The three theories considered suggest that learning provides increased clarity rather than increased uncertainty and complexity in terms of the relationship between the individual and the world. In the current tumultuous and tentative knowledge environment, the complexity of the learner's rapport with the world escalates through engagement in learning, and is complicated by an awareness of the multitude of perspectives through which the world can be known. The outcome of learning has changed from creating certainty and stability, to an opening up to uneasiness and to a tumultuous relationship with the world. The purpose of learning is to explore new ways of being beyond the current state; it has a future orientation rather than a focus on present participation. The goal is for the learners to know themselves and understand others within the context of the supercomplex world. I explore how rethinking learning might begin to address this objective in Chapter 5.

CHAPTER 5
RETHINKING LEARNING

Data (facts) and ideas (suggestions, possible solutions) thus form the two indispensible and correlative factors of all reflective activity. The two factors are carried on by means respectively of *observation* (in which for convenience is included memory of prior observations of similar cases) and *inferences*. The latter runs beyond what is actually noted, beyond what is found, upon careful examination, to be actually present. It relates, therefore to what is *possible*, rather than to what is actual. It proceeds by anticipation, supposition, conjecture, imagination. All foresight, prediction, planning, as well as theorizing and speculation are characterized by excursion from the actual into the possible. (Dewey 1933 p. 104)

I have now offered an argument for facilitating the development of students as meta-learners in academia, considered the cognitive capacities necessary for self-authorship and reflective judgement, reviewed three broad approaches to learning, and in the previous chapter I considered three different perspectives of learning in relation to the development of capacities required of the meta-learner. I have argued that the conceptions of learning applied in higher education will have implications for the outcomes of learning. The way learners understand reflects the organizing principles they use to make meaning out of their experiences (Baxter-Magolda, 1999). To achieve the desired disposition and cognitive skills for inquiry into knowing or metacognition requires certain beliefs about knowledge and about the value of inquiry (Kuhn, 2001; Kuhn & Dean, 2004). Learning must develop and reinforce these personal beliefs and attitudes.

While there is general agreement among researchers that an individual's personal epistemology develops and changes in a constructivist manner, how it occurs in terms of the underlying mechanism for change is a point of contention (Bendixen & Rule, 2004). Proposed mechanisms for epistemic change focus on epistemic doubt where learners continually question an objective truth based on an assumption that cognitive disequilibrium is the catalyst for development and change (Bendixen & Rule, 2004). I anticipate that a world of knowledge uncertainty, complexity, and change may provide the stimulus for cognitive disequilibrium amongst learners anticipated to be necessary for development. I propose that in response to this disequilibrium academia must utilize conceptions of learning that facilitate and support doubting

as well as the development of the skills necessary for the learner to navigate the doubting process.

Barnett (2011) believed that it would be difficult to reach a consensus on what constitutes effective learning when multiple perspectives and frameworks for knowing the world exist. He used the term *effective learning* implying that successful learning is associated with achieving some sort of goal or outcome. What constitutes effective learning is intrinsically linked to the desired result from engaging in the process of learning. With this in mind, I begin this chapter with a discussion of how the analysis of the application of the learning theories I presented in Chapter 4 has informed my thinking regarding learning and I consider how learning might be conceptualized assuming the desired outcome is facilitating development of students as meta-learners. I offer a conception of the learning process taking into consideration the anticipated relationship between knowledge and the learner when knowledge is assumed to be complex, uncertain, and changing. I consider how both the individual and the social conceptions of learning might be understood. I superimpose my own conception of learning onto the facets of the meta-learner.

The Relationship Between the Meta-learner and Learning

In learning, cognitive processes must be accompanied by metacognitive activities both socially, and within the individual meaning-making process, such that the embedded meaning associated with knowledge can be understood, and incorporated into new ways of knowing and new knowledge. There is both a personal and a social epistemology at work as people engage in learning (Khalifah & Rallis, 2010) that the learner must be aware of and understand within the learning process. The need for awareness of both the personal and social epistemology implies that there is a reflective element to all learning. Learning involves reflection on both the cognitive and the metacognitive elements embedded in the knowledge. Understanding how others know is a key element to personal meaning-making.

In Figure 5-1 I identify some of the key elements of the relationship between learning and the facets of the meta-learner described in Chapter 5.

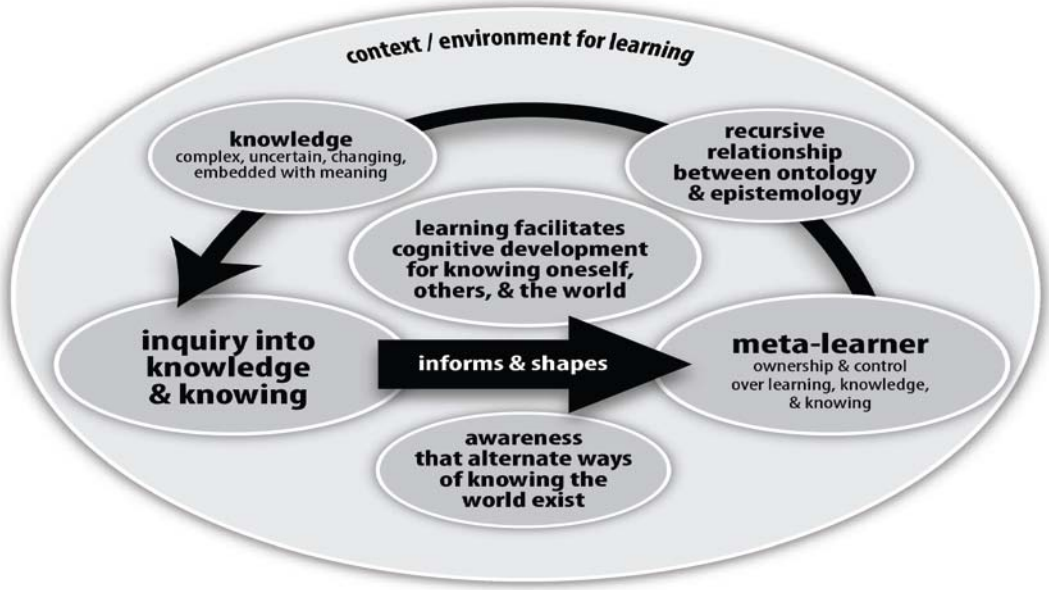

Figure 5-1. Key elements of the relationship between learning and the meta-learner

Central to the concept of the meta-learner is the capacity for self-authorship that allows the individual to author their own life and learning. It requires the meta-learner internalize the learning process through taking control and ownership of knowledge and the ways of knowing. Control and ownership over what is known, and how it is known, comes from the cognitive skills associated with reflective judgement and the cognitive dispositions to understand the value of engaging in inquiry for the purpose of knowing oneself and others within the context of the world. It is this knowing that is the purpose of learning, and involves reflection at the metacognitive level. Knowing requires actively seeking out how others know the world, and being open to ongoing meta-cognitive reflection for the purpose of considering alternate ways of knowing and being in the world. Keeping these elements in mind, I revisit the theories of learning and reflect on how they might inform learning when the capacities of the meta-learner are desired academic outcomes.

Insight from Learning Theory

In conceptualizing learning with this new outcome in mind, I look first to the three learning theories considered in the previous chapter and what they can contribute to my conception of learning. Based on the concept of effective learning I developed here, I offer some

insight into the elements associated with my thinking regarding learning that represent a departure from the theories evaluated. In the supercomplex environment, where knowledge is assumed to be tentative, and where there is an awareness that unknown alternate perspectives exist, learning is anticipated to create uncertainty for the learner both in terms of what is knowledge, and how it can be known. Ontology and epistemology are in constant flux, and the purpose of learning is to better understand oneself, others, and the world. Learning is the inquiry associated with this coming to know oneself, others, and the world. What constitutes effective learning is the processes that allow for this knowing when knowledge is uncertain, complex, and changing.

Individual learning theory informs the conceptualization of learning necessary in the age of supercomplexity through the constructs of mental models and an internal meaning-making process for learning. In particular, the humanist approach assumes personal growth is important and the objectives of learning extend beyond behavioural changes to include changes in values, attitudes, and beliefs. If cognitive capacities and personal epistemology are assumed to be subject to development it implies an ontological component to these constructs (Hofer, 2005). For the learner to be able to draw on cognitive skills associated with critical thinking and reflective judgement implies mental models of these constructs exist in the mind. The assumption that ways of knowing exist implies a structure or modeling approach to thinking about things that has an ontological element and is similar to the mental constructs within individual learning theory. Self-authorship, where the meta-learner takes control and ownership over learning, requires internalizing the meaning-making process.

Social constructivism offers to the understanding of learning in the current environment the influence of experiences on learning and the co-construction of meaning that takes place. Identity for the individuals who participate is assumed to be constructed through social interactions and is part of learning how to participate. The influence of social interactions and experiences on knowledge is assumed to be relevant to learning in the supercomplex world. Social constructivism assumes the individual has a learning goal of successful participation. This implies that learners think about the strategies employed by themselves and other participants to determine what constitutes successful participation. Personal strategies are modified by the learner to improve participation and contribute to the development of an identity

as a member of the group. The use of cognitive strategies, as well as the inferred learning and growth of these strategies, supports cognitive development as an aspect of learning. Implicit to the development of students as meta-learners as an academic outcome is that social learning processes can influence the identity or the sense of self of the learner. Social constructivism acknowledges that multiple realities and ways of knowing exist, a key underlying assumption of the conception of knowledge as uncertain, complex, and changing.

Activity theory adds the influence of culture and history to the social constructivism understanding of learning. The assumption that knowledge has both objective and subjective elements is relevant when alternate assertions about reality are assumed to exist and need to be evaluated for their merit. Activity theory assumes that the learner undertakes a meaning-making process when personal history and culture inform the individual's understanding of social participation in the world. The personal knowing, with cultural and historical elements as anchors, interacts with the social experience such that ontology and epistemology are altered. The construct of the meta-learner assumes knowledge has both an objective and subjective component that must be reconciled. The reconciliation of the subjective and objective allows for a more stable and constant sense of self and reality than is assumed by the social constructivist view.

Focusing On the Meta-Learner

The construct of the meta-learner is assumed to be associated with epistemic views that support learning when knowledge is tenuous. Personal epistemology is present and guides engagement in learning and knowing the world, determining both what and how meaning is derived from these activities (Hofer, 2002). It is the essence of how the learner knows (Bereiter & Scardamalia, 1989). When knowledge is uncertain, complex, and changing, both how the learner knows, and how others know, becomes highly relevant to the process of learning and the ultimate understanding of the world. To entertain alternate ways of knowing requires the learner have the cognitive capacities to understand and evaluate these perspectives. My discussion in Chapter 4 has made salient three core elements to learning for the meta-learner. I advocate that cognitive development, metacognition, and reflection are central to the processes of learning, and require further consideration than what is given to them within the three learning theories evaluated.

The three learning theories make specific assumptions about the personal beliefs regarding the nature of knowledge held by learners. Knowledge is certain or multiple co-constructed context-specific realities exist. Personal epistemology, how people think about knowledge, is assumed to be externally determined by experts within individual learning theory, socially co-constructed by participants according to the social constructivist view, and socially constructed with cultural and historical influences within activity theory. While activity theory acknowledges the iterative relationship of influence between the external world and the individual, personal concepts, beliefs, and norms are viewed primarily as tools for interacting with the world. Inquiry is assumed by activity theory to seek the truth that is relevant to action within the current social context. Personal beliefs are either a resource for or product of learning, and therefore the need to create an awareness of these beliefs and to develop them through the process of learning is not specifically addressed within any of the three learning theories examined.

Cognitive development. The concept of effective learning developed here for the meta-learner, assumes a central role of *cognitive development* in learning. Development and learning interact with a scaffolding effect; each leads to enhancements in the other, and both are transformed in the process (Hoare, 2006). Cognitive development occurs through knowledge restructuring, which involves learning, and is therefore inseparable from learning (Hoare, 2006). Cognitive development is essential to the learner's capacity for reflective judgement, and is necessary to take ownership for the ways of knowing and for the evaluation of knowledge (Torres, 2011). The control and ownership over knowledge and knowing processes and outcomes identified as essential for the meta-learner are not necessarily perceived as key elements of learning in the three theories explored. The concept of meta-learner developed here implies the student has a sense of self that although influenced by social interactions, has meaning outside of a particular social activity.

Cognitive development has implications for not only what can be known, but also the process of learning. As cognitive skills and disposition are transformed and developed through the learning process, they become resources for engaging in learning. Barnett (2011) advocated that as the student undertakes the process of coming to know, the sense of self or being is altered, and when altered, has further implications for the processes of knowing and what can be known.

The ontological and epistemological ramifications of learning are iterative. Cognitive skills are anticipated as a resource to the meaning-making process employed within the three learning theories considered, as either a tool for acquiring knowledge, or as a tool for successful participation. Cognitive development is a central goal of effective learning when the world is assumed to be supercomplex.

Metacognition. Related to cognitive development is the central role of *metacognition* in learning when knowledge is tentative and complex. The need for metacognition assumes the learner holds values related to inquiry into, and to the understanding of, personal knowing and the knowing of others. Individual learning theory assumes the appropriate way of knowing is determined by the source of knowledge based on objective evidence. Social constructivist and activity theory acknowledge multiple perspectives, but the need to understand personal and other ways of knowing is limited to the learner being able to successfully participate as a member of a social group. Within activity theory, culture and history, and the resulting power relationships, are acknowledged to shape and constrain the learning opportunity. These cultural and historical influences can restrict individual control and ownership over knowledge and knowing, and as a result the possibilities for action. Inquiry into knowing, assumed to be an essential element of learning as a means for building personal knowing and knowledge for the meta-learner, may tend to be ignored within social constructivist and activity learning theories.

Metacognition, and the role it plays in learning, is not well defined within any of the three learning theories discussed. Metacognitive processes occur in the mind, and involve the deconstruction of knowledge and the meanings attached to that knowledge. Metacognition requires thinking about thinking, including how the individual knows, or comes to know something. There is a reconciliation of the external world with the internal world. Individual learning theory views the meaning of knowledge as externally determined by experts and metacognitive analysis may not be a significant element to learning. Social constructivism and activity theory assume meaning is co-constructed and the role of metacognitive analysis is limited to understanding how to participate. Within social learning theory, learning does not focus on cognitive processes of the mind. For all three learning theories, legitimate ways of knowing are externally determined, either defined by the assumed expert sources of knowledge or constrained by what is deemed to be socially appropriate action. The need for metacognition

as an essential element to the meaning-making process of knowing associated with learning may tend to be ignored within the three learning theories.

Reflection. Metacognition is a form of *reflection*. Reflection is thought to be an essential component to learning (Berry, 2011; Ellström, 2006; Høyrup& Elkjaer, 2006; Parboosingh, 2002; Raelin, 2001; Rodgers, 2002). When knowledge is uncertain, complex, and changing, reflection is key to the meaning-making process the learner must undertake to know self, others, and the world. The process of coming to know involves critical self-reflection and active doubting (Barnett, 2011). This self-reflection, and evaluation of alternate ways of knowing, implies a need to know that extends beyond the immediate ability to participate. The process of coming to know takes into consideration awareness of how others know, and involves reflection on knowledge both at the cognitive and meta-cognitive levels.

Complex and uncertain knowledge can only be understood by considering the meaning attached to it. While individual learning theory might involve reflection at the cognitive level to determine the truth of a statement based on empirical evidence, the self-reflection associated with considering how one knows would be of less importance. For the social constructivist, reflection is a tool employed in the construction of meaning for successful participation within the immediate social context. Although activity theory would support reflection as a means of shaping reality in the mind, how the mind engages in reflection is primarily influenced by the subjectivity of others, and therefore knowing is socially constructed. Reflection is analytical rather than exploratory, present not future oriented, as the learner seeks to select from the socially acceptable options for action, the most appropriate alternative. Inquiry into knowing through reflection is essential to addressing ill-structured problems. Reflection for the purpose of evaluating and justifying the basis for an argument or action would not be a significant element of learning within the three theories.

Reflection for the meta-learner needs to consider how both the learner and others know, and to actively consider alternate ways of knowing that may be outside the current legitimate means of social engagement. The meta-learner understands that the current social context could be otherwise and entertains the possibilities this might create through reflection. It is only when the learner moves beyond considering the knowledge, social situation, culture, and history as it exists, to considering the influence of the meaning-making process through metacognitive

reflection that the possibilities beyond what is known become accessible. There is an anticipation by the learner of the known unknowns that requires the goals of learning move beyond the constraints of legitimate participation within the current context to contemplating through reflection the possibilities learning creates for knowing oneself, others, and the world.

Embedded Meaning

Paavola and Hakkarainen (2005) suggested that our tools and technologies are embedded with significant amounts of meaning. These tools embody even more knowledge and intelligence than in the past, making participation in the world more sophisticated. Khalifah & Rallis (2010) stated that social experiences are complicated making it inappropriate to try and understand them within one approach to thinking or frame of representation This speaks to the complexity of knowledge and suggests that to know something requires an understanding of the meaning embedded in it. In Figure 5-2 I illustrate the relationship between individual meaning-making and knowledge embedded with meaning. Learning is the process through which meaning is applied to information.

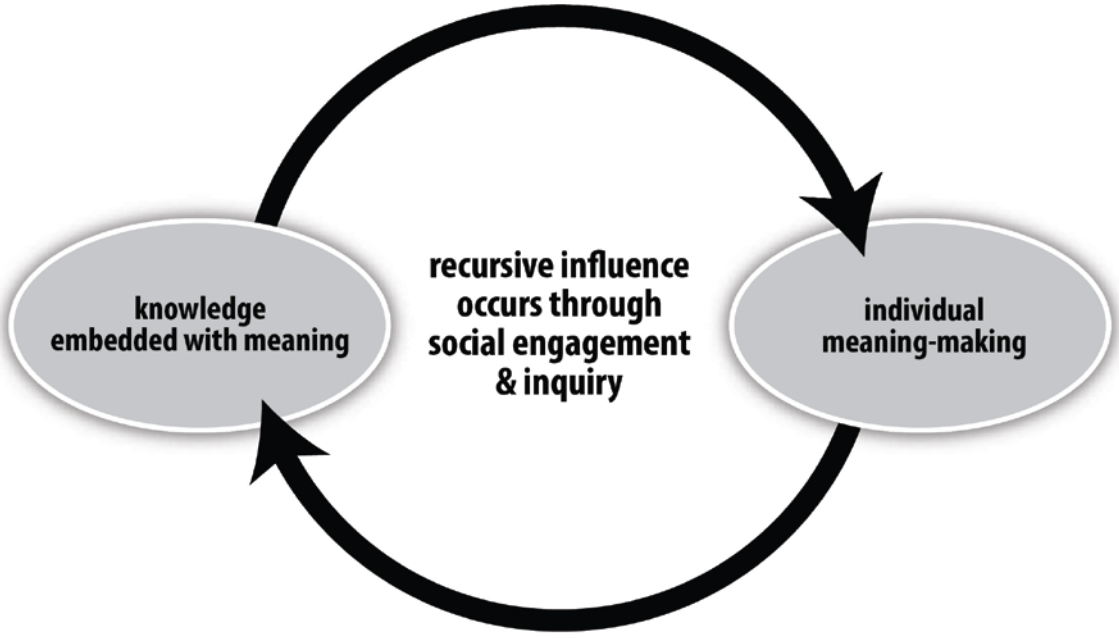

Figure 5-2. Recursive relationship between the individual meaning-making and knowledge

As previously defined, knowledge is created when meaning is attached to information. In the current environment where knowledge is complex, uncertain, and unchanging, it is not possible to *know* something without considering its ontological and epistemological characteristics. In the age of supercomplexity, where knowledge proliferates, perhaps learning only occurs when the meaning, understood to include the metacognitive strategies embedded in it, has been made known to the learner. The only way to understand the knowing of others is to consider the metacognitive activities employed by those knowers in the meaning-making process.

Integrative Learning

I concur with Rendón's (2009) conception of integrative learning as making connections among diverse ways of knowing as well as connecting those ways of knowing in the world with personal development, meaning, and purpose. It is this connection with personal development, meaning, and purpose that offers insight into the meaning-making process associated with learning when knowledge has no boundaries. My thinking about the meaning-making process involved in learning is consistent with Baxter Magolda's (2009) work described in Chapter 2 on the cognitive, identity, and relationship meaning-making capacities and maturity necessary for learner success in a complex knowledge world. Baxter Magolda's (2009) advocated learner control over meaning-making comes from the cognitive skills of examination and reflection. While Baxter Magolda suggested that maturity in terms of cognitive and intrapersonal capacities related to meaning-making are reached and become a resource for learning, I postulate that when knowledge is complex, uncertain, and changing, cognitive development is an ongoing process associated with the act of learning. The cognitive skills and disposition necessary to engage in learning in the current knowledge environment will be continually shaped by the inquiry into knowing. Engaging in learning both shapes and reinforces these capacities. Cognitive development becomes central to learning.

Meaning-making

Baxter Magolda (2009) identified the personal meaning-making process as informing the social learning and knowledge construction. I advocate that given knowledge is embedded with

meaning there is a social component to learning and knowledge creation but that learning, defined as the process by which meaning is applied to information, happens when the learner comes to both understand the meaning embedded in the knowledge being considered and undertakes a personal meaning-making process creating ownership over the new knowledge and way of knowing. There is an active role for the individual mind in understanding and constructing new knowledge. If learning about something requires an understanding of the meaning that is attached to it, there is metacognition involved in learning, and learning involving knowledge embedded with meaning can only occur when meta-strategies are employed.

Individual meaning-making

The individual meaning-making process associated with learning anticipated to be required when knowledge is assumed to be embedded with meaning, is shown in Figure 5-3.

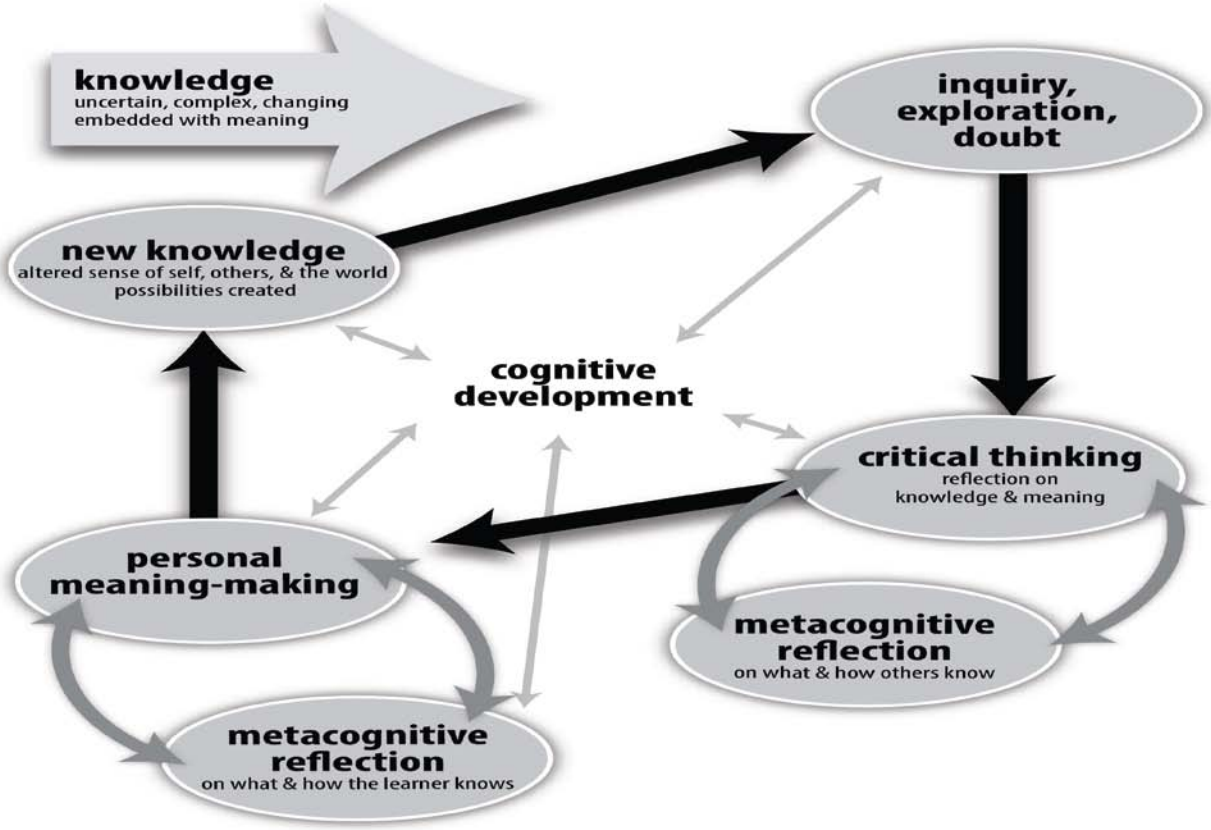

Figure 5-3. Rethinking learning: Individual meaning-making process

I illustrate in Figure 5-3 that assuming knowledge is embedded with meaning learning has cognitive development as central to the process. Cognitive development has a recursive relationship with learning. Cognitive development is facilitated by the learning process, shaped and transformed through the meaning-making activities of learning, but is at the same time a resource and regulator for engaging with the world in learning.

Learning involves reflection at both the cognitive and meta-cognitive levels. The learner utilizes cognitive skills and cognitive dispositions to unpack the knowledge, holding it up to the light and examining not only the content, but the knowing, embedded in it. Mezirow (1990) advocated that the evaluation of knowledge was two-dimensional. He argued that the learner needs to evaluate the merits of the assertion itself, and evaluate the contextual nature of the knowledge, critiquing the social norms and cultural codes associated with it.

It is only when the perspectives of others are considered, that the learner can reflect on personal understanding of knowledge at both the cognitive and meta-cognitive levels. Engaging in this exercise informs and shapes cognitive development. Through engaging in reflection at both the cognitive and meta-cognitive level the learner reaches a new understanding of the knowledge. The process of engaging with the knowledge alters the sense of self and personal understanding of the world. The learner's self-awareness of how he or she knows things opens up possibilities to critique and self-reflect while understanding how others know opens up shared space, communication, and creates bridges between worlds. Possibilities are created.

Kuhn (2000) described the importance of learners reflecting on their own thinking, and being able to monitor and manage the way in which that thinking is influenced by outside sources. She identified two levels of cognition as the performance level and the meta-level. When there is feedback from the performance level to the meta-level regarding the thinking strategies employed it becomes possible to consider the effectiveness of the strategies and improve performance of the strategies. It heightens awareness and understanding of the strategies as well as making it possible to understand their power and limitations. This feedback provides the learner with control over the learning process and enhances the strategies employed. The meta-level is assumed to both direct the application of cognitive strategies employed at the performance level and is modified by the performance level.

This process of meaning-making is depicted using a model similar to that employed in an action research inquiry. It is cyclical, and supports the recursive nature of inquiry assumed when ontology and epistemology are in constant flux. The individual meaning-making process is a form of inquiry involving socially constructed knowledge. Given the knowledge is embedded with meaning, it requires not only an understanding of what the knowledge is, but also of the meaning attached to the knowledge. Knowledge embedded with meaning requires the learner employ cognitive processes, both at the cognitive level and at the metacognitive level, to consider what is known and how it is known. This includes understanding how others know it.

The cognitive skills and disposition necessary for examination and reflection in learning constitute self-authorship (Pizzolato, 2010), providing both the capacity and motive for engaging in ongoing inquiry into knowing the uncertainty and complexity of the world. Ownership and control over the learning process comes from cognitive development that is fostered through engaging in an examination and reflection at both the cognitive and metacognitive levels. This ownership and control over the learning process, and the learning outcomes, provides a sense of confidence and validation for the learner, giving meaning to engaging with the world. The value of learning becomes apparent, providing the motivation for further learning.

Social meaning-making

There is a social dimension to learning and knowledge construction. The individual meaning-making process occurs in tangent to the social experiences that inform and shape the knowledge and its embedded meaning. I show in Figure 5-4 the social facet to learning that mirrors the individual meaning-making process.

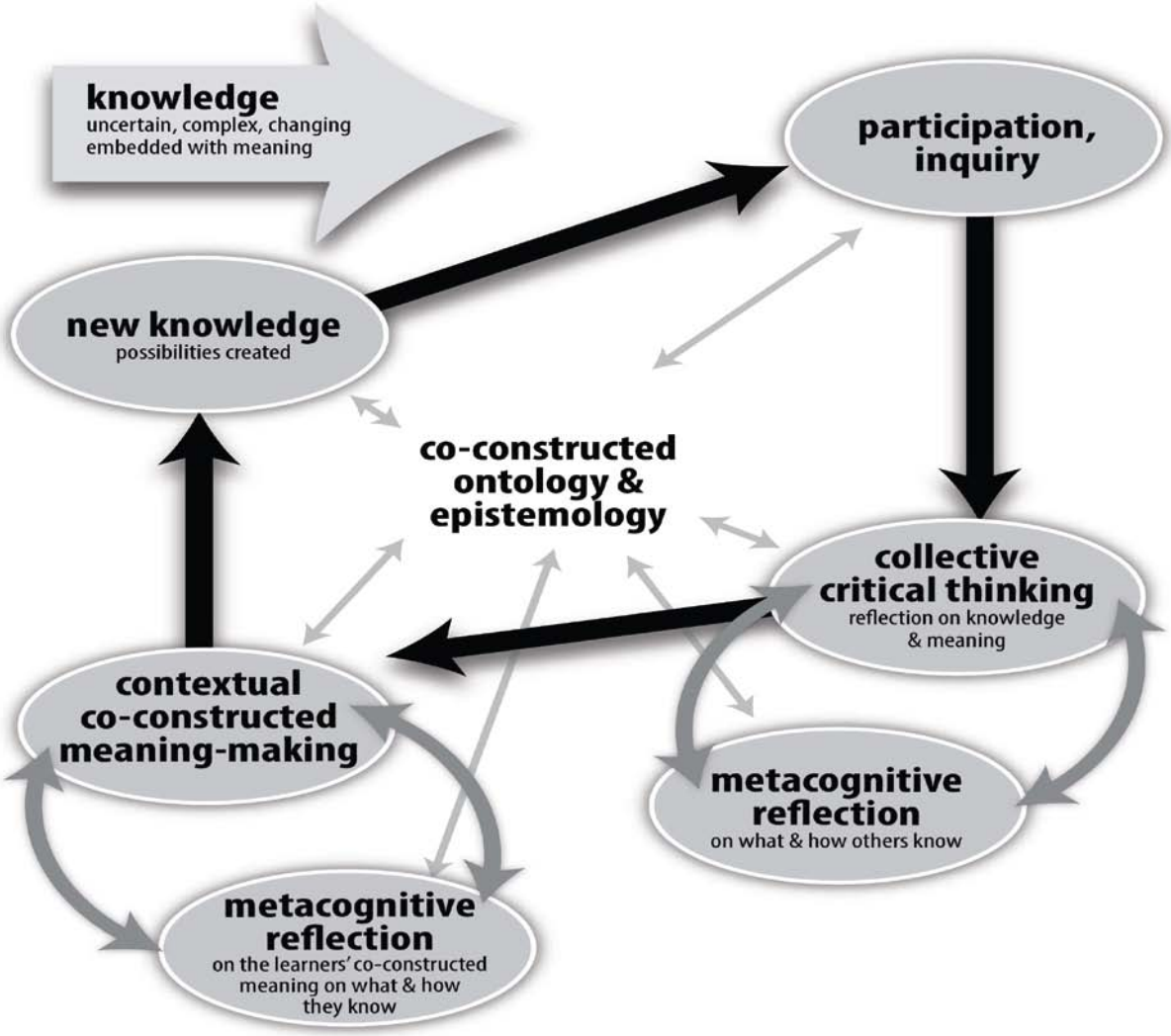

Figure 5-4. Rethinking learning: Social meaning-making process

In Figure 5-4 the assumption I make again is that knowledge is embedded with meaning. The content of reality, and how that the learners collectively know that reality, is represented by the co-constructed ontology and epistemology present in the social experience. What is assumed is that the individual meaning-making processes essential to learning depicted in Figure 5-3 are occurring simultaneously with the social learning processes illustrated in Figure 5-4. The individual meaning-making processes are the engines for the social processes, the resources the individual brings to this collective activity but at the same time the collective activities of inquiry

fuel the individual meaning-making processes. They are separate but co-dependent processes that interplay for learning.

Socially, individuals engage with the world through the consideration of knowledge embedded with meaning that can only be understood through reflection at both the cognitive and the metacognitive levels. When knowledge embedded with meaning comes to the learners collectively for consideration and transformation, a metacognitive inquiry is required. When knowledge is tumultuous and tentative knowing requires this kind of collective reflection that mentors and informs the individual meaning-making processes of learning. Consideration of the meaning attached to the knowledge under consideration by the group creates a bridge to a new co-constructed meaning through social processes of reflection by the learners. It is only when reflection on the embedded meaning is coupled with social meaning-making activities that the possibilities created by that knowledge are apparent. The collective, co-constructed ontology and epistemology are employed in the process of engaging in reflection. The reflection informs and shapes these social constructs as well as the participants' sense of self as a member of the group. These social processes inform the knowledge that the individual engages within the personal meaning-making process. Inquiry, when problems are ill-structured, requires this kind of reflective engagement at both the personal and social level. The ability to entertain and explore the perspectives of others is an essential component of learning. Similar to my conception of learning having both personal and social dimensions, Mezirow (2009) believed the two major elements of transformative learning were critical self-reflections on assumptions and participation in dialectical discourse to validate that personal reflection.

Learning for the Meta-learner

Taken together, the personal and social meaning-making processes represent the conception of learning considered necessary for the meta-learner. In Figure 5-5 I superimpose these processes on the conceptualization of learning and the meta-learner to delineate the content of learning.

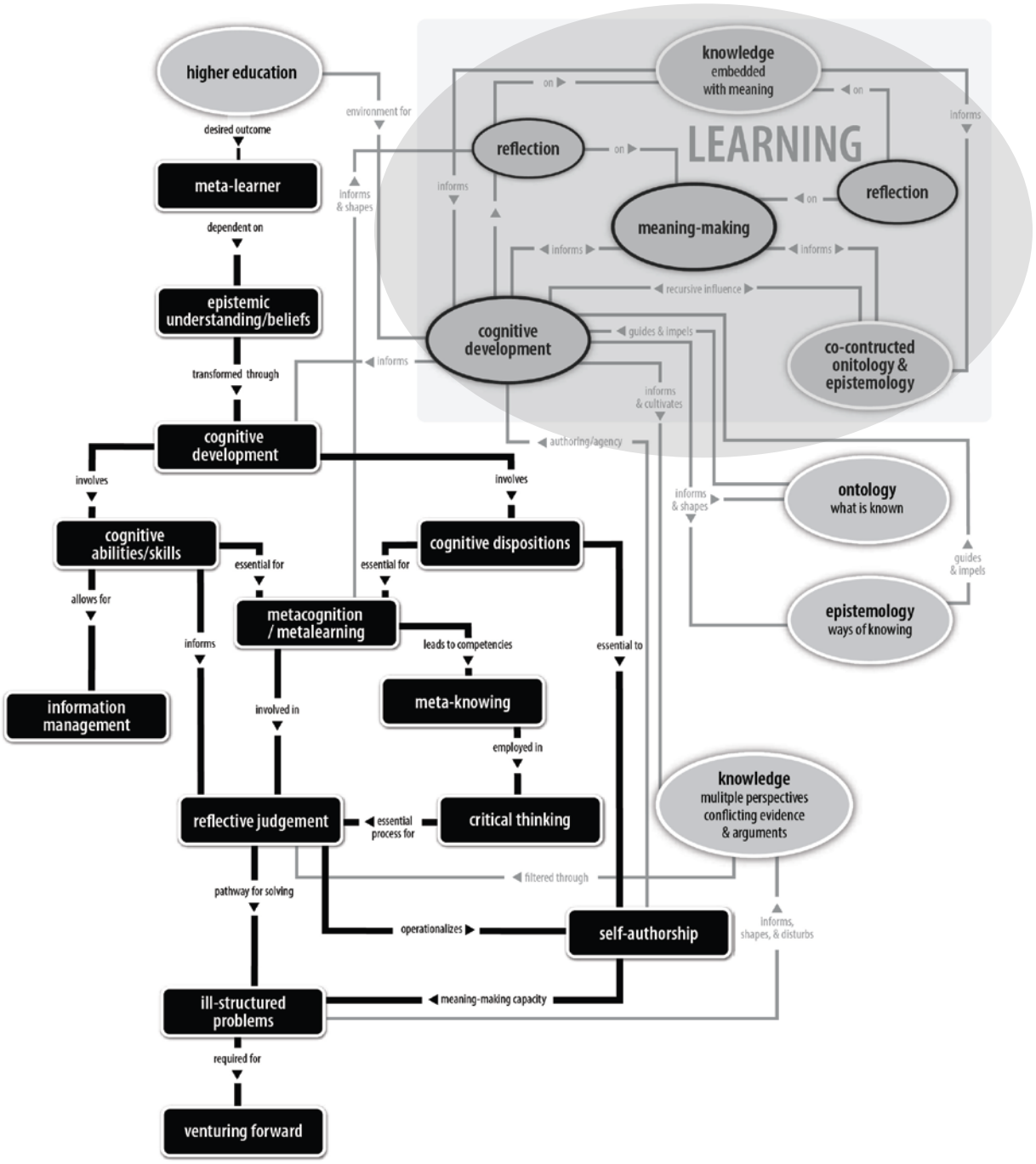

Figure 5-5. Learning for the meta-learner: Keeping cognitive development, metacognition, and reflection central

The purpose of learning depicted in Figure 5-5 is development as a meta-learner. The goal is to come to know oneself, others, and the world. The content of learning is cognitive development and a sense of self as a meta-learner. Learning happens through the meaning-making processes of reflection at the cognitive and meta-cognitive levels.

Metacognition informs and shapes the reflection undertaken for both individual and social meaning-making. Cognitive development involves engaging in reflection on how others know. In Figure 5-5 I depict how others know as part of the embedded meaning associated with the knowledge. Personal meaning-making where the learner considers both what and how they know both employs and informs cognitive and meta-cognitive skills and cognitive disposition. The recursive relationship between cognitive development and social learning processes is depicted in the concept map through the connection between cognitive development and co-constructed ontology and epistemology. Experiences must be reflected on, made sense of, and evaluated in relation to the experiences of others for knowledge to be created (McDermott, 1999). Co-constructed ontology and epistemology are informed by the collective meaning-making processes of the learners who participate and by others outside the immediate learning experience through the knowledge embedded with meaning. Reflection by the group at both the cognitive and meta-cognitive levels leads to social meaning-making processes that inform the shared ontology and epistemology.

This conception of learning for the meta-learner has cognitive development, metacognition, and reflection as central to the processes of learning. Learning as conceptualized here assumes that knowledge comes to the learner with intrinsic meaning and involves unpacking through reflection that embedded meaning to achieve an understanding of how others know. This understanding of how others know is instrumental to the personal meaning-making processes. When knowledge is complex, uncertain, and changing, the learner must consider as part of the learning process the metacognitive strategies employed in knowledge creation and meaning-making. Awareness and monitoring of personal ways of knowing and of thinking strategies makes it possible for the learner to take ownership and control over the meaning-making process and outcomes of learning. Given that knowledge is complex, uncertain, and changing, the ways of knowing, and the thinking strategies employed in the learning process, are

constantly evolving and transforming. This ongoing evolution makes cognitive development central to the learning process.

Cognitive development necessary for student development as a meta-learner is dependent on a conception of learning that has cognitive development as central to the learning process. While engaging in the learning process, the meta-learner develops a sense of self as a learner through cognitive development and the meaning-making process within learning. As the meta-learner develops capacity for reflective judgment and self-authorship, engagement in the learning process becomes more meaningful, and the individual is able to take control and ownership over the learning process including the core functions of meaning-making, reflection, and cognitive development. As the meta-learner comes to control, direct, and author personal learning and growth, the capacity to deal with knowledge that is complex, uncertain, and changing is enhanced. Reflection at the metacognitive level makes it possible for the learner to not only understand what he or she knows and how he or she knows, but to take ownership over that knowing creating a personal confidence in the capacity for learning and engaging with others to consider alternate perspectives, and conflicting evidence and arguments. The meta-learner identity is innately tied to the process of learning that informs the meta-learner's cognitive development necessary for coming to know oneself, others, and the world. At the same time identity is shaped and guided by the meta-learner's cognitive skills and disposition.

Venturing Forward

It has been suggested that for students to have learning goals requires that they can see a knowledge state beyond the one they currently possess (Mason, 2003). This implies that the process of learning may challenge preconceptions and prior understandings of knowledge and the world, and through the process of coming to know challenge both personal conceptions and understandings of the learner. Barnett (2011) as previously discussed perceived no end-points or closure associated with learning but instead a continual opening up. This sense of free-falling in terms of being able to understand the world may be overwhelming for the learner when knowledge proliferates and is understood to be fleeting.

The learning theories discussed offer three alternatives for addressing the sense of drift that can occur when the learner is aware of known unknowns. One option is to in a sense deny the tentative nature of knowledge and assume as with individual learning theory that in fact

knowledge is certain, defined, and limited. Alternatively it is possible as with social constructivist learning theory to embrace the concept that multiple perspectives are possible and exist but are of little significance beyond the relevance to immediate interactions. Understanding the world is defined for the learner by the current context of this immediate interaction. Taken to the extreme, the need and ability to in any way guide or control the learning process and ways of knowing would be unjustified (Davis & Sumara, 2002; Elkjaer, 2005). A third option is to assume as activity theory does that current experience is informed by history and culture and it is only the individual's interpretation of his or her interactions with the world that is relevant and again confines the understanding required through learning.

All three theories of learning offer the learner an anchor, a temporal sense of certainty in terms of what is to be known and how it is known through learning. Although the processes and content of learning are different within each of the learning theories discussed, perhaps this need for grounding as an outcome of learning may be the key to ensuring learning has value for the learner when knowledge is tentative and tumultuous. It is anticipated to achieve the level of comfort with the knowledge and meaning attached to it required by the meta-learner necessitates control and ownership over knowing.

In the conception of learning I propose in this chapter, the process of reflection on knowledge embedded with meaning at both the cognitive and meta-cognitive levels presents the learner with alternative ways of knowing and the uncertainty associated with this. However, when the learner understands and controls his or her own ways of knowing, it becomes possible for the individual to own both what he or she knows and how he or she knows it. It is this ownership that offers the learner a sense of certainty and security within the process of learning when knowledge is uncertain, complex, and changing.

Consistent with Belenky, Clinchy, Goldberger, and Tarule's description of the connected knower (Clinchy, 2002) reflection on both how others know, and how the learner knows, creates a bridge between the learner and the world. The learner is able to see his or her way of knowing relative to that of others. This positioning of oneself relative to the world creates a sense of confidence and security as a learner. When the learner controls and owns the knowing, the value of learning is perceived as the possibilities it creates in terms of an improved understanding of oneself, others, and the world. In the next chapter I discuss the implications of my

conceptualization of learning for both teaching and learning within the context of higher education.

CHAPTER 6

VENTURING FORWARD THROUGH CREATING POSSIBILITES

> Reflection is not identical with the mere fact that one thing indicates, means, another thing. It commences when we begin to inquire into the reliability, the worth, of any particular indication; when we try to test its value and see what guarantee there is that the existing data *really* point to the idea that is suggested in such a way as to *justify* acceptance of the latter. (Dewey, 1933, p. 11)

In Chapter 1, I developed an argument for the meta-learner when knowledge is uncertain, complex, and changing. I discussed in Chapter 2 the importance of personal epistemology and beliefs about learning as the basis for understanding the learner's meaning-making capacity, and approach to complex problem solving and knowledge creation. In Chapter 3, I provided an overview of three different approaches to learning as background to my discussion in Chapter 4 of the implications of applying existing learning theory in higher education when the development of students as meta-learners is the desired outcome of academics. I put forward in Chapter 5 my arguments for the need to rethink the conception of learning to focus on cognitive development of students as meta-learners. I identify the central roles within learning of cognitive development, metacognition, and reflection. In Chapter 6, I offer some final thoughts on the implications of the conceptualization of learning developed here for the learner and educational programs. I consider where this conceptualization of learning might take me in terms of my future research, and some concluding remarks.

Schön (1995) postulated that educational institutions have an epistemology that may or may not be explicitly stated, but is engrained in institutional structures and practices. If knowledge is understood to be uncertain, complex, and changing, and knowing requires both cognitive and metacognitive reflection, the structures and practices of the institution need to change to support this. One of the underlying arguments of this study is that consistent with Barnett's (2011) thinking, learning needs to be conceived of as an opening up to the possibilities rather than a journey toward certainty and closure. Reflection is essential to understanding the embedded meaning in knowledge assumed to exist when knowledge is complex. The conception of learning I developed in Chapter 5, proposes a central role for cognitive development in

learning. Cognitive skills and disposition are both developed and employed in the process of learning.

Metacognition has been identified as an essential component to learning. Metacognition is thought to be developmental, becoming more explicit, powerful, and effective as it comes under the individual's conscious control (Kuhn, 2000). Research into epistemological development suggests that individuals don't even develop an awareness of metacognitive processes until after high school, if at all (Hofer, 2001). Thus, the skills and disposition to undertake the kind of metacognitive analysis necessary to consider how we learn, how we think about things, and how we know, are often not available as a resource to learners coming into higher education (Hofer, 2001). To address this, King (2000) provided from the literature on personal epistemology, a number of ways academia can support epistemological development and promote reflective thinking, including discussing controversial issues and ill-structured problems; providing opportunities for students to analyze the perspectives of others as well as their own, and make judgements about the adequacy of the supporting arguments and evidence; supporting students in developing skills related to building an argument and making judgements; and encouraging students to collectively, in a safe environment, evaluate and practice their reasoning skills. It seems logical that learning should be infused with opportunities to both build and experiment with these cognitive skills, but this assumes that within academia cognitive development is a desired outcome of learning. Education needs to support the conception that learning occurs through the learner taking control and ownership over the meaning-making process.

My Contribution to the Knowledge Discourse

I have advocated that knowledge is only created when meaning is applied to information. The contribution I make to the knowledge about learning comes from the meaning-making process I have engaged in as I considered, explored, and evaluated the abundant literature that holds the knowledge, embedded with meaning, related to learning, personal epistemology and the current role of higher education in an environment of knowledge uncertainty, complexity, and change. My contribution to the ongoing debate about the purpose and outcomes of learning in higher education lies in the conceptualization of the meta-learner and the examination of how

employing existing learning theories might facilitate the learning required for the development of students as meta-learners.

In exploring the relationship between the meta-learner and learning I offer for consideration a new perspective on the content and process of learning when knowledge is complex, uncertain, and changing. I anticipate that as faculty work to convey the vast body of knowledge associated with a specific discipline, the content of learning needs to constantly facilitate cognitive development and a sense of self as a meta-learner. I put forward that given the complexity and uncertainty of knowledge, learning needs to be conceived of as occurring through the meaning-making processes of reflection at both the cognitive and metacognitive levels. This has direct implications for instructional and curriculum design.

I argue for the importance of learners having control and ownership over their own learning and ways of knowing in the current environment of tenuous knowledge and multiple frameworks for knowing. Opportunities for learners to take ownership and control must be integrated into all learning experiences and has significant implications for learning in higher education as it requires instructors make space for, and cultivate, the personal meaning-making that supports the development of these capacities. This underpins the learner's sense of agency to deal with the ongoing self-doubting associated with learning. I maintain that learning must fundamentally focus on creating possibilities for understanding and knowing oneself, others, and the world.

Creating Possibilities for Knowing Self

Socialization in childhood, as Mezirow (1991) pointed out, involves power inequality, with mentors invested in their own identity attempting to influence and define the reality of others through their own interpretations and values. For students to perceive of themselves as having ownership and control over their learning and ways of knowing requires academia provide both mentorship and supported learning experiences that offer opportunities for engagement in, and reflection on, the processes of individual meaning-making. Academic leaders must first conceive of knowledge and learning as having elements of control and ownership for the learner, and convey this to students through the processes employed in learning. Providing validation for multiple ways of knowing amongst learners recognizes personal ownership over knowledge and makes learners aware that other ways of knowing exist and have value. In reality

we do not know what or how students are learning. I contend that instead of asking what students know we need to start asking how they know, how they understand, and how they think about the subject matter or problem under discussion. The possibilities for knowing need to be considered and cultivated in our classrooms.

While school-aged children may not have developed an awareness of the metacognitive skills necessary for reflective judgement, it is still possible to engage young students in discussions at the metacognitive level such that they begin to understand both how they know, and that others know differently. There has been research done on teaching and learning strategies aimed at the development of metacognitive skills in children (Bryce & Whitebread, 2012; Fisher, 1998; Tok, 2013). I anticipate that instrumental to doing this is to consider the construct of imagination that I have alluded to a number of times in my dissertation. I return to the definition I proposed for the meta-learner that includes engaging within the learning process in imagination for the purpose of identifying new possibilities for knowledge. Dewey (1933) described imagination as abstract thought that sees familiar objects in a new light.

If the educational system begins to consider the connection between imagination and metacognition it becomes possible to *imagine* how educators might begin to engage even the youngest learners in discussions about why and how they think about things. These discussions begin to push at the boundaries of cognitive thought. Even at the preschool level, it is possible to ask "Why do you think that?" and "How do you know that?" or "Can you imagine another way this could be?" There has been interesting work on the use of wonderment questions generated by school age children as a means of improving classroom learning (Scardamalia & Bereiter, 1992) and how this might be linked to meta-learning (Watkins, 2001).

Formal learning needs to engage with the knowledge in ways that allow learners to develop an awareness and understanding of their own metacognition. It requires teaching to the possibilities that learning and knowledge creates for understanding self, others, and the world. When instructors involve students collectively in the processes of reflective judgement to evaluate alternative perspectives and interpretations of course content, the merit of constructing a well-informed argument and weighing evidence becomes apparent to the learners. Engaging students in reflection on their own thinking and understanding of the knowledge being examined facilitates and validates personal meaning-making. Exploring with students to understand how

collective reflection on knowledge can inform personal meaning-making builds bridges between social learning and personal cognitive development. Having these kinds of integrative learning experiences begins to make visible the connection with personal development, personal meaning, and personal purpose in learning; and as a result, facilitates the development of a disposition that values this kind of inquiry into knowing.

To mentor students in ownership and control over learning requires that educators engage learners in educational experiences that provide opportunity for personal meaning-making involving metacognition. Personal ownership and control over learning requires that teachers make space through instructional design, and within curriculum, for the activities of personal reflection and metacognition. Educators facilitating the learning need to teach to the possibilities that come from engaging with existing knowledge, when it is uncertain, complex, and changing. If knowledge is assumed to be embedded with meaning, engaging with that knowledge must include processes that begin to unpack what is known, and how it is known.

Mezirow (1990) suggested that for most adults, learning has greater significance when it relates to understanding the meaning of what others are asserting. Learning about something involves uncovering the metacognitive constructs associated with the knowledge. Facilitating the cognitive disposition of learners that supports active inquiry requires educators engage students in both cognitive and metacognitive reflection on course content. Curriculum and instructional design need to incorporate learning processes that encourage students to examine their own knowing and that of others.

This conception of learning requires a cognitive disposition that values inquiry for the possibilities it creates. These possibilities become salient to the learner through both reflection on the meaning embedded in current knowledge and reflection on personal understanding and meaning-making. There are possibilities embedded in current knowledge that can be discovered by engaging in cognitive and metacognitive reflection on the meaning attached to the knowledge. When the individual engages in both the cognitive and metacognitive reflection associated with personal meaning-making new knowledge and possibilities for learning are revealed and created. Implicit to creating possibilities within learning is the student taking ownership and control over personal knowing and having self-efficacy related to authoring his or her own life. There has been considerable research on empowerment, which is related to control and ownership that will

not be discussed here (Bradbury-Jones, Sambrook, & Irvine, 2010; Brooks & Young, 2011; Linnenbrink & Pintrich, 2003; Zraa, Kavanagh, & Morgan, 2013).

The disposition required is a prerequisite to the motivation for learning. What motivates learners will be dependent on their general attitudes and outlooks about learning, as well as the specific content. Motivation for learning is related to disposition, with attitudes toward learning assumed to influence motivation (Pintrich, 2004). The kind of motivation required to engage in the learning depends not only on the content of the activity, but the learner's perceptions about the learning experience, including purpose of learning, self-efficacy, and value of the learning activity (Pintrich, 2004). Motivation for learning has also been extensively researched, and will not be discussed further.

Creating Possibilities for Knowing Others

If the outcome of learning is uncertainty and self-doubting about what is known, the tentative nature of knowledge conceptually suggests limitations in personal knowing. The limitation in personal knowing represents an epistemological constraint that can unsettle or disturb the sense of being, an ontological implication of learning (Barnett, 2009). Without both the skills and disposition to undertake the exploration and evaluation of how others know, learners have to instead dismiss other perspectives and fortify their own understanding to maintain a stable sense of self. The unsettled state of self that comes from acknowledging limitations in personal knowing is anticipated to be resisted, and avoided, by the learner who feels inept in undertaking the reflection necessary to bridge personal understanding and knowing with that of others through social processes. When the learner is not prepared to make reflective judgements, the student loses the possibilities created by entertaining and incorporating the knowing of others into personal meaning-making. The tumultuous and tentative nature of knowledge can either be conceived of as constraining, when the learner perceives himself or herself as unequipped to take ownership over knowing, or as creating possibilities beyond the current state of knowing, when the learner conceives of himself or herself as being the author of his or her own learning destiny. Identity is essential to social learning in that it combines competence and experience into a way of knowing (Wenger, 2000).

Kelly's work on personal construct theory, as described by Zuber-Skerritt (1992), offers some insight into a learner's ability to consider alternative perspectives. This capacity for

evaluation is related to the permeability of their construction systems. Kelly described individuals as having personal constructs that are used to view and understand the world, and when constructs are refuted or invalidated by experiences with others, there can be hostility and resistance. It is important for individuals to see these constructs as open and subject to change. How to achieve this openness is one of the challenges for educators.

Through participating in collective reflection that facilitates awareness and understanding of personal epistemic beliefs, students internalize these metacognitive processes. By employing metacognitive strategies in social reflective activities, the individual is able to consider the effectiveness of alternative strategies employed in the group, and incorporate these into personal meaning-making activities. Learners develop the confidence, and build the skills necessary, to consider perspectives in direct contrast to their own. To reconcile and incorporate other ways of knowing into personal meaning-making requires development of both cognitive skills and cognitive disposition.

Just as important as understanding the processes involved in applying consistent well-informed criteria for weighing arguments, is that the student have the attitude that such evaluation is of value and within his or her capacity to undertake. It is only when learners believe they know what to do with contradictory perspectives that are inconsistent with their own understanding, that they are able to entertain these alternative interpretations of meaning. Well developed cognitive skills and cognitive disposition allow the student to step back and detach himself or herself from his or her personal ways of knowing sufficiently to understand how other know, and to hear alternative arguments and evidence for knowing. The learner becomes capable of monitoring and managing how personal meta-strategies are influenced by others. Cognitive development as I have described it, gives the learner control over how knowledge embedded with meaning will influence personal meaning-making.

It is through this opening oneself up to the understanding of the perspectives of others, and taking ownership and control over how these perspectives influence personal meaning-making, that the student comes to know and respect others. Conceiving of personal knowing as separate, yet in a recursive relationship with the knowing and meaning-making of others, makes it possible for the learner to engage with others for the purpose of imagining possibilities beyond the current state of reality. Woodhouse (2011) argued it is imagination that facilitates through

learning the creation of alternative, not yet considered possibilities that can challenge the status quo. He argued imagination is a significant force in the creation of any community of learning, and provides the opportunity for productive thought that can change the human condition and enrich the sense of community.

It is only possible to consider how others think about knowledge and knowing when the learner understands his or her own thinking and meaning-making processes. With knowledge constantly changing and growing, the student must be able to draw on multiple ways of knowing and strategies for coming to know, to understand knowledge in its complex and tentative state. Given that knowledge is complex, uncertain, and changing, the meta-strategies that were employed by the learner in the past may no longer be appropriate for understanding new or changing knowledge. Learning must be thought of as constantly informing the metacognition and the meta-strategies employed in understanding the meaning attached to knowledge. It makes the relationship between the process of learning and cognitive development recursive.

Educating for the Possibilities

Developmental approaches to personal epistemology imply the teacher needs to provide contextual support for students to help them develop their epistemological views (Hofer, 2004). Brookfield (1987) stated that the central activities of groups engaged in critical thinking were identifying and challenging assumptions, and exploring alternative ways of thinking and acting. Students need opportunities to ask questions and practice the cognitive skills in a variety of situations (King, 2000).

Vygotsky's (1978) concept of the zone of proximal development, and the construct of scaffolding, offer insight into how human development occurs and might be facilitated through learning. The zone of proximal development assumes there is a zone of activity where the individual can operate and progress with assistance and support. It is important that the learning experiences offered be matched to the learner's developmental level zone that exists between the current development and the potential development possible with proper support and guidance. Put in layman terms, what is required, according to Vygotsky, is to challenge but not overwhelm the learner, such that the individual feels capable yet not incompetent. The learner moves from the place of current understanding and development to achieve an expanded and personally advancing state of cognitive development and knowing.

In academia, I believe we tend to make misguided assumptions about the capacity of learners to make sense of, and engage with, the knowledge. Although it is necessary as a basis for engaging in learning for students to know the language used by a discipline to converse, the rote transfer of information alone does not acknowledge students as being capable of creating and articulating personal meaning from the subject matter. Conversely, when complex ideas and formulas are presented without sufficient articulation of the purpose or connection with other learning experiences, personal meaning-making becomes difficult and frustrating for students. Both situations do not support development of thinking skills. These approaches to teaching and learning do nothing to support student control and ownership over learning, but may instead lead to a disillusioned and disempowered student population that believes it has nothing to offer to the knowledge creation process.

Vygotsky (1978) emphasized the importance of collaboration in the developmental process. He argued that although the formal learning process was not synonymous with development, learning experiences that are in fact properly constructed will result in cognitive development. Vygotsky believed that there is a scaffolding element to development where through learning the student can acquire basic cognitive skills that provide the foundation for ensuing development of more complex, internal mental processes.

Vygotsky's (1978) zone of proximal development is defined as existing between the current level of development for each learner and the potential level of development achievable with proper support and guidance. Although the concept of scaffolding has been discussed extensively in the literature, it is often conceived of as supporting the student by connecting present learning to previous understanding and the student's current level of development (Lin et al., 2012; van de Pol, Volman, & Beishuizen, 2010). I contend that it is the potential development horizon associated with the zone that requires consideration when knowledge is complex, uncertain, and changing. I believe it is here that educators should focus their attention as they develop learning opportunities, always being mindful of the developmental potential or possibilities created for the student through learning.

As academia continues to develop programs, courses, curriculum, and instruction in response to the knowledge economy, the opportunities for learning created need to be grounded in the possibilities for personal development these educational experiences offer for the learner.

I maintain that if educators cannot imagine and articulate the possibilities a proposed learning opportunity creates for the development of the learner, it does not warrant further consideration. Those who engage others in learning should do so with a clear vision of the possibilities the anticipated learning creates for everyone involved in the experience. The new role of higher education is in illuminating the possibilities created by engaging with knowledge that is complex, uncertain, and changing. It is not about answers, but instead about preparing students for the ongoing examination of what constitutes knowledge and knowing.

Curriculum and instructional design should focus on connecting existing knowledge with the possibilities it creates for learners, for it is only through this potential that it has meaning for the learners and contributes to their development. If this consideration and cultivation of the possibilities created by learning is the foundation of our educational programs and course content, it becomes easier to envision how learning can be the personal and the social meaning-making processes I have proposed for the meta-learner. This represents a rethinking of both teaching and learning, moving the focus from teaching to learning.

According to Mezirow (1991) cognitive development is both part of, and an outcome of, learning. In adulthood, the knowledge contradictions existing in society become apparent. To avoid being overwhelmed by these conflicting sources of information, the adult learner begins to seek out new perspectives to improve understanding, and to achieve greater control over his or her life. When the learner abandons applying old ways of knowing and seeks out alternative ways of knowing, it is what Mezirow refers to as transformative learning.

Mezirow (1991) advocated essential to adult learning is the process by which ideas are justified and validated. Transformative learning involves reflective assessment of the assumptions employed in determining the validity and justification of an idea. Processes are employed to determine the conditions under which an idea is valid, and involves questioning the beliefs, value judgements, and knowledge used to make this evaluation. A consequence of this process is the perpetual questioning of those beliefs and judgements such that perspectives on meaning-making are constantly restructured. Reflective learning involves the ongoing reassessment of assumptions associated with the learning experience itself, and the processes employed to understand and engage in it. Mezirow offered interesting insight into intentional learning and meaning-making through reflection that will not be elaborated on here, but provide

the foundation for understanding how academic programs might begin to operationalize these concepts.

I noted with particular interest Mezirow's (1991) reference to imagination as crucial to understanding the unknown. Imagining a state beyond the current reality is central to beginning the transformative process. Mezirow (2009) claimed the assumptions learners make about people, things, and events, become their reality. These expectations have a significant influence on how the learner interprets an experience, tending to become a self-fulfilling prophecy. It is imagination that creates the alternate possibilities for understanding the meaning of that experience, and interpreting the perspectives of others (Mezirow, 1991).

The meta-learner is open to considering alternate frames of reference, as this is essential to understanding the perspectives of others and their way of knowing. Imagination allows the learner to set aside personal knowing and perspectives, making visible the embedded meaning associated with knowledge. Mezirow (1991) argued that the more learners are reflective and open to the perspectives of others, the greater their capacity to imagine alternative frames of reference for understanding.

Creating Possibilities in Higher Education

Tagg (2010) talked about single and double-loop learning in terms of the changes to teaching and learning occurring on campuses that are leading to innovations, but not transformation. The reality is that academic programs and institutions acknowledge that students are not learning, but all that changes is the content of the programs or course work. This response represents a form of single-loop learning, where when the desired outcome is not achieved, the content or strategies of the activity that was suppose to achieve the outcome are changed in anticipation of obtaining the desired, different result. Changing content assumes that the activity itself, and the underlying assumptions and values that support that activity as it is carried out, are correct and appropriate for achieving the desired outcome. However, in the case of academic programs, Tagg argued there is a need to change the underlying paradigms to achieve the desired transformation within education to make teaching and learning central on academic campuses. To achieve this transformation requires double-loop learning where the underlying values and assumptions of the institution are shifted.

An important step toward cultivating a shared vision for the development of students as meta-learners is to raise the collective consciousness within academia regarding conceptions of knowledge and learning in higher education, and the intrinsic relationship between these conceptions and the outcomes of learning. Graduate students, as the future academic faculty, should be required to learn something about how people learn and how to teach critical thinking and writing skills to others (Shepard, 2013).

Kuhn (2001) suggested that for the learner to evolve to the evaluativist level of epistemic beliefs requires relocating the source of knowledge from the known object to the known subject. Setting this process in motion usually requires an awareness that multiple and conflicting perspectives of the *truth* or *reality* exist. Acknowledging that multiple frameworks exist, and are therefore being employed in both teaching and learning, compounds the uncertainty of learning and knowledge creation for students. What is necessary is to move beyond this awareness to the evaluation and eventual judgement of the merits of the alternative perspectives being considered based on sound arguments and evidence. It has been suggested that critical thinking, writing, and numeracy, should be priorities within all academic programs (Shepard, 2013).

Perhaps one of the first steps to changing the conception of learning in academia might be to think about the language educational leaders use to talk about learning. I think consideration should be given to avoiding the word teaching. The language educators use, as with all forms of knowledge, is embedded with meaning. Teaching is often perceived of and often experienced as something quite linear. It has come to be embedded with constructs of power, control, and a unidirectional transfer of information. I wonder if a more appropriate term would be engage. The word *engage* suggests that the learning experience will be more active, a process, and journey or exploration. Engage implies a more constructivist approach to learning, and starts to share the power and control over the process. Engagement begins to create a space for the meta-learner within the learning experience.

Possibilities for Future Research

This study was a conceptual examination of learning in higher education. The intention of this dissertation has been to stimulate the conversation about the purposes and conceptions of learning in higher education. I have offered for reflection, a conception of learning, giving consideration to the anticipated needs of the meta-learner when knowledge is assumed to be

complex, uncertain, and changing. As Newton (2005) once said "If I have seen farther, it is by standing on the shoulders of giants." I acknowledge that my thinking and personal meaning-making around learning is informed by many of the giants in educational research who have come before me. I have offered here my thoughts and conception of the learning process in anticipation that it will stimulate the thinking of those interested in facilitating meaningful learning experiences for students. Perhaps more importantly, I hope that given the learning imperatives associated with knowledge complexity, uncertainty, and change, this discussion will create a sense of urgency for the need to see farther than those who came before us. It is time to consider how academia might "find its way" again in terms of improving the learning experience associated with undergraduate programs.

This work represents only one conception, my conception, of learning, and as such offers fertile ground for further thinking, alternative ways of knowing, and personal meaning-making on the ideas presented here. I have, through the use of the concept maps, tried to offer a visual window into my thinking, my metacognition, about concepts of learning as they relate to the development of students as meta-learners. The concept maps and associated discussion of learning within the context of the meta-learner can be thought of as my attempt to articulate for the reader, not just the concepts of the meta-learner and learning, but the embedded meaning I have attached to these notions.

My premise that facilitating the capacities of a meta-learner should be an academic outcome is a starting-point for others to consider, explore, and debate, the meta-learner as both a concept and an outcome of learning. Further work to cultivate the desired meta-learner identity, and consider the implications of this concept for education, is required. Future exploration, within this conceptualization of learning, of the implications for the role of the instructor, and what constitutes teaching, is of interest. Although this work has focused on learning within higher education, it is relevant, and warrants further consideration, to undertake research at the primary and secondary levels related to the conceptualization of learning, in anticipation of the meta-learner put forward here.

Future research needs to begin to discuss this conceptualization of learning with all academic stakeholders to garner feedback and input that will serve to consider its robustness and academic validity. How this construct might be moved from conceptualization to application in

the academic setting, is an area for further study. I intend to explore how this conception of learning might be used to inform curriculum development, instructional design, and assessment within an individual course, as well as the implications of adopting this conception of learning at the program and institutional levels.

The role of educational design research is to apply theory through real world learning experiences, allowing for evaluation and refinement of the theory based on the outcomes. The work done on personal epistemology and cognitive development as I have outlined in Chapter 2, provides a starting point for developing new learning practices that support the conception of learning outlined for the meta-learner. Design Research (Collins, Joseph, & Bielaczyc, 2004; Edelson, 2002) has been used as a means for advancing understanding of theoretical constructs through design experiments that develop and refine educational designs by going through iterative cycles of design and implementation. Formative research examines a design in practice with the intention of moving toward progressive refinement of both the design and underlying theoretical constructs (Collins et al., 2004). Design research is anticipated to be an appropriate way to begin to study the application of this conception of learning within real world educational practice.

Venturing Forward: Creating Possibilities

Living with ambiguity (Barnett, 2011) requires the individuals be prepared for, and committed to, a life of perpetual learning, cognitively coupling and blending vast amounts of knowledge, always critiquing those linkages by reflecting through the lens of awareness other perspectives exist, and still others are possible. Meta-learners are integrative thinkers who are open to, and make connections amongst, diverse perspectives and pieces of knowledge from a variety of sources. They have problem-solving skills that allow them to succeed in identifying both the question that needs to be asked, and the steps necessary to answer it. Meta-learner adds to the concept of integrative thinker, insight regarding the purpose and process of learning, and leverages this knowledge to take ownership of the learning process and outcomes.

For students, these skills and integrative cognitive abilities can be fostered within inquiry-based learning experiences that demand critical thinking and reflection through metacognition. Opportunities to learn involve not just solving, but identifying, the problems and questions to be asked. The processes of learning is made transparent and articulated as part of the

experience, with opportunities to examine the underlying assumptions, multiple perspectives, and personal belief systems that shape the journey. Learning requires integration be embedded within all aspects of the educational experience. Learning creates for the learner, a consciousness of the possibilities for moving beyond the current boundaries of self, to be otherwise. As Wenger (1999) put it, learning is not merely formative, but transformative. Perhaps, more accurately in the current environment, transformative with the promise of being formative.

Concluding Thoughts

McDermott (1999) stated that new knowledge is created at the boundary of the old, and can only be shared within the present context through participation in community dialectic processes. What happens when knowledge no longer has boundaries? What has been proposed here is that the learner as the author of his or her own life both creates and removes the boundaries for knowledge and knowing. The sense of agency that comes from this ownership over learning makes it possible for the student to use formal learning experiences within academic programs as the catalyst for personal reflection on other problems and issues of personal relevance to the learner. It is out of these processes that the possibilities of learning become known to the learner.

It is through the sense of self as a learner that the meta-learner finds meaning and purpose in learning in an environment of uncertainty and self-doubt. The meta-learner has the skills and abilities to control personal ways of knowing, making it possible through learning to be both cognitively open to considering other ways of knowing, and to arrive at answers to ill-structured problems through reflection. Controlling and owning learning, knowledge, and ways of knowing, requires a belief that there is value in knowing oneself, others, and the world. This belief comes from the ability to conceive of the possibilities learning holds, creates, and inspires. Collectively these cognitive skills, beliefs about the value of learning, and sense of self as a learner, underpin the will to venture forward.

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